ECONOMIC IMPACTS CHAPTER 6

Potential modifications to the Atlantic Large Whale Take Reduction Plan (ALWTRP) would result in economic impacts to commercial fishermen. The regulatory alternatives under consideration would require affected fishermen to modify their gear and/or refrain from fishing in specified areas when whales are known or likely to be present. These requirements would impose additional costs on fishermen and the commercial fishing industry as a whole, and might also affect the revenues of individual fishermen by altering the location or timing of their effort. In response to these pressures, it is possible that some fishermen might switch their effort to other fisheries or quit fishing entirely.

The following discussion describes the methods used to estimate the costs that commercial fishermen would incur in complying with potential modifications to the ALWTRP (Section 6.1), and presents the results of this analysis (Section 6.2). These cost estimates represent the direct impact of new regulations on the commercial fishing industry. They also provide a foundation for subsequent evaluation of the regulations' potential effect on commercial fishing activity, and the implications of such effects for communities that depend on the commercial fishing industry. The discussion is organized as follows:

- Section 6.1.1 describes the development of the model vessels upon which the cost analysis relies;
- Section 6.1.2 describes the data sources and methodology employed to estimate compliance costs under each regulatory alternative;
- Section 6.1.3 describes the data sources and methodology employed to estimate the number of vessels that would be affected by new requirements under each regulatory alternative;
- Section 6.2.1 presents the results of the cost analysis and identifies the factors that contribute to differences in estimated compliance costs across alternatives;
- Section 6.2.2 describes the distribution of compliance costs by region and fishery;
- Section 6.2.3 presents estimates of average compliance costs for vessels operating in different regions and fisheries; and

- Section 6.2.4 presents estimates of the number of vessels in different regions and fisheries that would be required to comply with changes in ALWTRP regulations.

6.1 ECONOMIC IMPACT ASSESSMENT METHODOLOGY

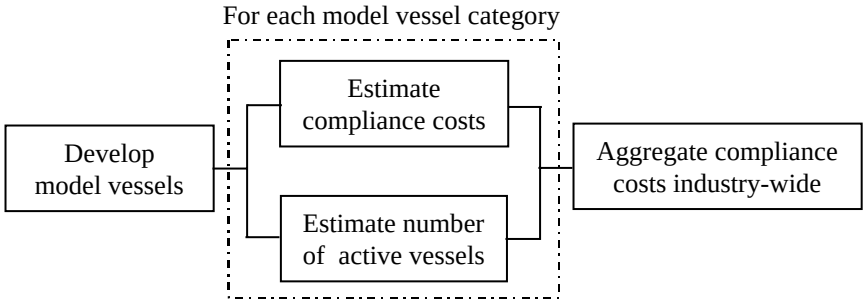
The costs that fishermen are likely to incur in complying with revisions to the ALWTRP depend upon the extent to which the new regulations would require them to modify their current operations. The extent of the modifications required depends not only upon the content of the new standards, but also upon a variety of factors that characterize a given vessel's current operations, including the fishery (or fisheries) in which the vessel participates, the seasons and locations in which the vessel operates, the regulations to which it is already subject, and the current configuration of the vessel's gear.

Given the broad scope of the ALWTRP, a vessel-by-vessel analysis of the costs of complying with new regulatory requirements is infeasible. Instead, the analysis is based upon model vessels, each of which represents a group of vessels that share similar operating characteristics and would face similar requirements under a given regulatory alternative. As Exhibit 6-1 illustrates, the analysis estimates regulatory compliance costs for each model vessel. This cost estimate is then multiplied by the number of vessels that belong to the category the model represents. The product of this calculation is an estimate of regulatory compliance costs for all vessels in a given category. The sum of costs across all vessel categories provides an estimate of regulatory compliance costs for the commercial fishing industry as a whole.

The discussion below describes this methodology in greater detail. Additional information on the data and assumptions employed is provided in the appendices to this chapter.

Exhibit 6-1

ECONOMIC IMPACT ASSESSMENT METHODOLOGY



6.1.1 Development of Model Vessels

The first step in the economic impact analysis is specifying the factors that are likely to affect the cost of complying with modifications to the ALWTRP. Identifying these factors provides a basis for defining categories of vessels that are likely to face similar compliance costs. Once these categories are defined, a model vessel representing each category can be developed.

The regulations currently imposed under the ALWTRP vary by fishery, location, and time of year. Potential modifications to the ALWTRP, as embodied in the regulatory alternatives under consideration, would follow a similar approach. Thus, compliance costs would be expected to vary depending upon the fishery in which a vessel participates, the location in which it operates, and the seasons in which it is active. The development of model vessels must capture these differences.

In addition to capturing differences in regulatory requirements, the development of model vessels must take into account differences in compliance costs that would result from variations in vessels' operating characteristics, particularly the nature, configuration, and quantity of gear that vessels employ. For example, lobster trap/pot vessels fishing in Cape Cod Bay may configure their traps/pots in pairs or in trawls; since this difference could have a significant impact on the costs of complying with ALWTRP requirements, it is important to differentiate between such vessels in the cost analysis. Similarly, the configuration of gear and operating characteristics of vessels participating in other trap/pot fisheries could vary significantly depending upon the species they target. Within Northern Inshore waters, for example, vessels targeting black sea bass or conch/whelk employ different configurations of gear, and thus are likely to face different compliance costs. Again, it is important to differentiate between such vessels in the cost analysis.

Based upon these considerations, the economic analysis specifies 103 model vessels, each of which represents a group of vessels that is likely to face similar compliance costs. The set of models includes 28 representing lobster trap/pot vessels, 55 representing other trap/pot vessels, and 20 representing gillnet vessels. Appendix 6-A lists the model vessels and specifies the configuration of gear assumed for each. The quantity and configuration of gear specified for each model vessel is designed to be representative of current operations for vessels in that category, based upon information obtained from the following sources:

- NMFS Gear Specialists – To characterize typical configurations of gear for lobster trap/pot, other trap/pot, and Southeast gillnet vessels, NMFS gear specialists working with the Northeast Regional Office (NERO) and the Southeast Regional Office (SERO) were consulted. These individuals provided information based on their own experience and on outreach to state agencies.

- Gillnet Gear Characteristics Survey – To characterize typical configurations of gear for Northeast gillnet vessels, the analysis relies on data collected through the Northeast Domestic Fisheries Observer Program, which is operated by NMFS' Northeast Fisheries Science Center (NEFSC). The Northeast Domestic Fisheries Observer Program collects,

maintains, and distributes data on fishing activity off the Northeastern and Mid-Atlantic U.S. for scientific and management purposes. Under the program, trained scientific observers travel aboard commercial fishing vessels to obtain data that are not readily obtainable by other means, focusing in particular on detailed observation of gear rigging and deployment.[1]

6.1.2 Assessment of Vessel Compliance Costs

The regulatory alternatives under consideration would require commercial fishermen operating in the lobster trap/pot, other trap/pot, and gillnet fisheries to comply with standards designed to reduce the risks of large whale entanglements with fishing gear. The economic impact analysis measures the cost of complying with these new requirements relative to the status quo – i.e., a baseline scenario that assumes no change in existing ALWTRP requirements. Thus, the analysis focuses on the costs of complying with potential changes to the ALWTRP, and does not address the cost of complying with ALWTRP requirements that are already in place.[2]

The costs that fishermen would incur as a result of the regulatory changes under consideration can be divided into three categories:

- Gear modification – To comply with the regulatory alternatives, affected vessels would need to modify their gear (e.g., replace floating groundline with non-floating line).

- Gear loss – As a result of certain requirements, some vessels might experience an increase or decrease in gear loss.

- Additional fishing restrictions and closures – Certain vessels would be required to follow specific restrictions on their operations (e.g., they might be required to tend gear when fishing at night) or to cease operations in designated areas during specified time periods.

Fishermen would incur some of these costs on an ongoing basis. Compliance with gear modification requirements, however, would in most instances require an initial investment above and beyond that ordinarily made in the course of routine gear maintenance and replacement. To

[1] Since its implementation in 1989, the program has deployed an average of 35 observers each year. This team of observers averages a total of 2300 days at sea annually.

[2] This is not to imply that implementation of the ALWTRP's current requirements is costless. Commercial fishermen clearly incur costs to meet current standards. The economic analysis, however, is designed to measure costs on an incremental basis – i.e., to measure the *change* in costs associated with a *change* in regulatory requirements. If no change in regulatory requirements is imposed – as would be the case under Alternative 1, the no-action alternative – the costs of complying with the ALWTRP would remain unchanged. Thus, the incremental cost of the no-action alternative is zero.

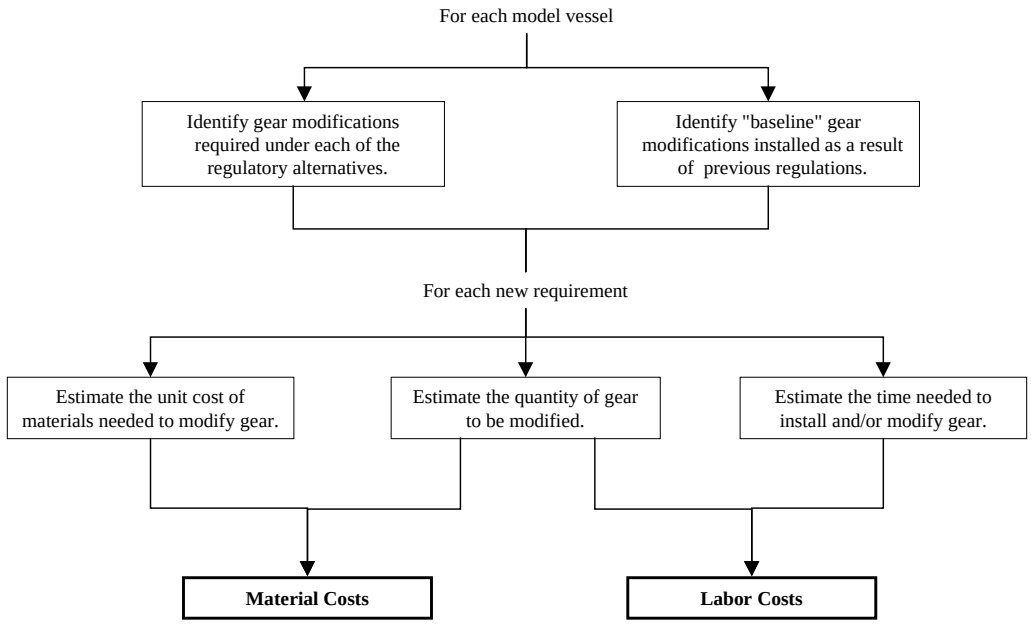
appropriately reflect the opportunity costs associated with the timing of such investments, the analysis presents these costs on an annualized basis.[3] All costs are reported in 2003 dollars.

6.1.2.1 Gear Modification Costs

Gear modification costs include material and labor expenses that would be incurred by fishermen to comply with new ALWTRP requirements. Exhibit 6-2 illustrates the methodology employed to estimate these costs. As shown, for each regulatory provision applicable to a model vessel, the analysis identifies new gear modification requirements (i.e., modifications that are not already specified under existing rules), estimates the material and labor required to bring all gear into compliance, and calculates the resulting cost. For each provision, material costs equal the product of the quantity of gear to be converted and the unit cost of the materials needed to achieve the required modifications. Labor costs equal the product of the time required to implement a specific modification, the quantity of gear to be converted, and the labor rate.[4] All costs are calculated on an incremental basis, taking into account any savings in material or labor costs that might result from efforts to comply with ALWTRP regulations. Additional detail on the assessment of gear modification costs is provided below.

Exhibit 6-2

METHODOLOGY EMPLOYED TO CALCULATE COSTS OF FISHING GEAR MODIFICATIONS



[3] The calculation of annualized costs is based on a seven percent annual discount rate, consistent with current guidance from the Office of Management and Budget (1992).

[4] The analysis assumes a labor rate of $9.876 per hour (2003 dollars), which is the mean hourly labor rate provided by the U.S. Bureau of Labor Statistics (2001).

Identifying the Required Gear Modifications

The determination of the gear modification requirements that apply to a particular category of vessel is based upon a detailed assessment of each regulatory alternative, one of which NMFS may ultimately identify in the FEIS. Appendix 6-B provides a series of exhibits that identify in detail the gear modification requirements applicable to particular vessels under Alternatives 2 through 6. In general, the potential changes include:

- Weak Links – Installation of weak links at all flotation and weighted devices attached to the buoy line, or on gillnet panels.

- Groundline – Conversion of floating groundline to sinking and/or neutrally buoyant groundline.

- Buoy Line – Conversion of all or a portion of the buoy line to sinking and/or neutrally buoyant line.

- Anchors – Secure anchoring of certain gillnets with a device of a specified weight, type, or holding power (e.g., an anchor with at least the holding power of a 22 pound Danforth-style anchor) at each end of the net string.

- Set Restrictions – Limitations on gear configurations such as allowing only one buoy line for trawls of four or fewer traps/pots and prohibiting single traps/pots.

Additionally, in order to improve data on the location and type of fishing gear that becomes entangled with large whales, the regulatory alternatives would expand current gear marking regulations, requiring affected vessels to mark all surface buoys with a vessel or permit number, and all buoy lines with a four inch color mark every ten fathoms.

It is important to note that, as a result of existing ALWTRP regulations, certain vessels may already be subject to the gear modification requirements specified by a given alternative. This analysis only examines the cost of modifications that would be newly applicable to a particular group of vessels. For example, Alternative 2 would require Northern Nearshore lobster trap/pot vessels to convert all floating groundline to sinking and/or neutrally buoyant groundline; however, vessels within this group that fish within the Seasonal Area Management (SAM) zone during the designated period are already subject to this requirement. As a result, for the subset of Northern Nearshore lobster trap/pot vessels that fish within the SAM area, Alternative 2 would impose no additional groundline conversion costs.

Gear Modification Cost Estimates

The analysis of gear modification costs relies on information provided by (1) NMFS gear specialists, who provided unit cost information for gear-marking materials, and (2) commercial marine suppliers, who provided unit cost estimates for weak links and fishing line. NMFS gear

specialists also provided estimates of the labor time required to implement specific modifications. Appendix 6-C provides summaries of these material and labor cost parameters.

Calculation of Gear Modification Costs: Initial Costs

Initial costs represent the costs that would be incurred by fishermen as a result of gear modifications required within six months of promulgating new ALWTRP requirements. For example, under Alternatives 2 through 6 this would include the costs associated with installing weak links. Exhibit 6-3 illustrates the methodology employed to calculate the initial cost to install weak links at all flotation devices off the buoy line for lobster trap/pot vessels fishing in Northern Nearshore waters. Other examples of gear modification costs that the analysis treats as initial costs include:

- Under Alternatives 2 through 6, the cost of marking all buoy lines with one mark every ten fathoms;[5] and

- Under Alternatives 5 and 6, the cost of installing non-floating groundline for vessels fishing in modified SAM waters.

Under Alternatives 2 through 4, other trap/pot vessels active north of 40 degrees 00 minutes N latitude would also become subject to existing dynamic area management (DAM) requirements. The analysis assumes that these vessels would modify their gear in accordance with DAM provisions in the initial year of the rule, thereby remaining eligible to fish in active DAM areas where NMFS implements a mandatory gear modification.[6] The DAM provisions required to continue fishing in a triggered DAM zone include:

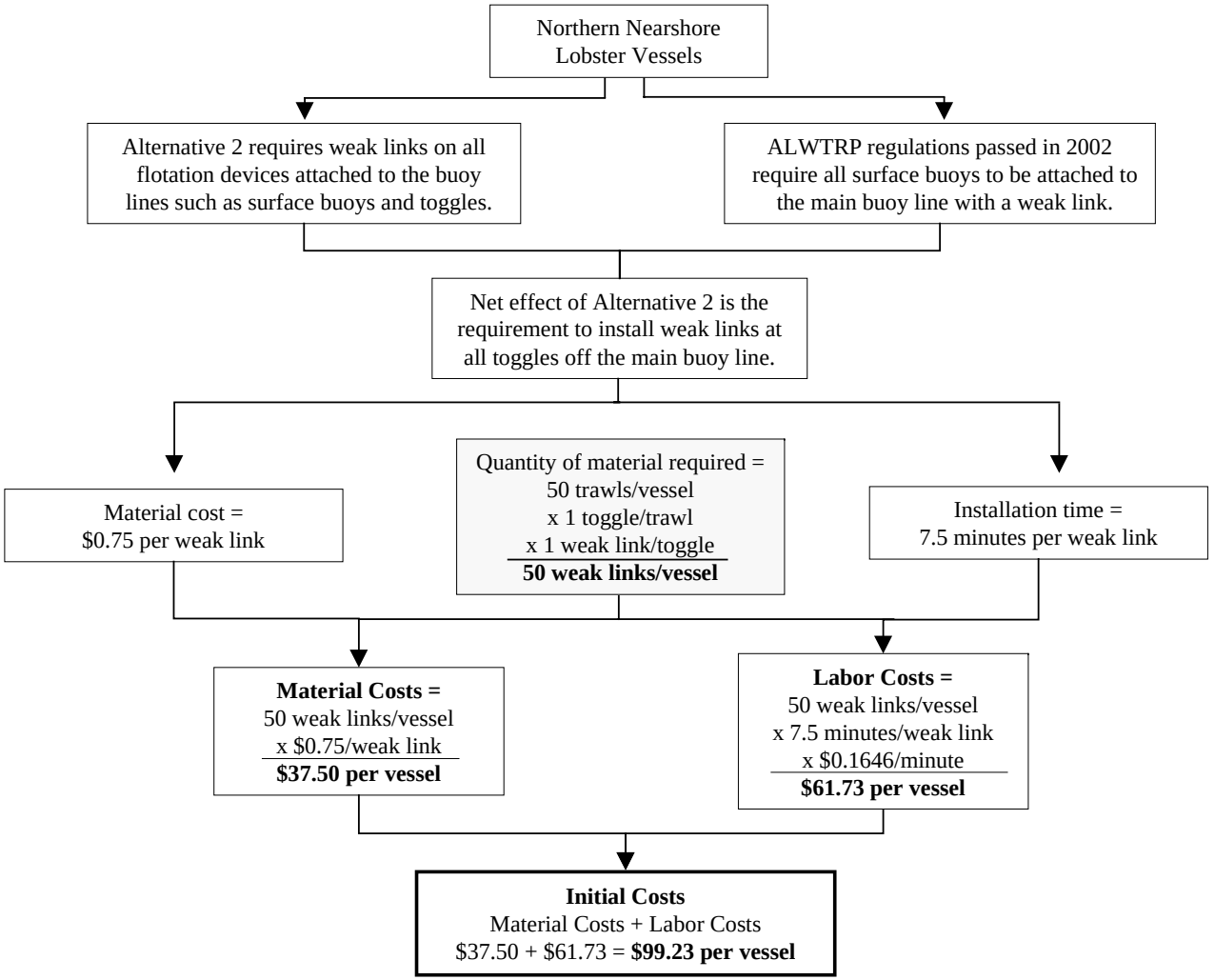
- Groundline Modification - Groundline must be made entirely of sinking and/or neutrally buoyant line. Other ALWTRP provisions require that other trap/pot vessels make this modification by 2008. Consequently, this DAM Program provision represents an accelerated gear modification.

[5] Manufacturers of commercial fishing line may be able to produce line that includes the appropriate color-coded marks. It is unclear, however, whether color-coded line would be commercially available in sufficient quantities for fishermen to comply with new gear-marking requirements within the timeframe the regulations would specify. In addition, the additional cost of integrating color coding into the production of fishing line is unclear. In light of these uncertainties, compliance cost estimates are based on the assumption that fishermen would mark their line after purchasing it from the manufacturer.

[6] If NMFS implements a mandatory gear modification in response to a triggered DAM zone, vessels that do not modify their gear according to the DAM provisions would be required to remove the gear from the DAM zone. In this case (and in cases where NMFS implements a mandatory gear removal within the DAM zone), the economic impact on affected vessels could include additional vessel operation time and lost catch during the time the gear is removed from the water.

Exhibit 6-3

EXAMPLE: METHODOLOGY EMPLOYED TO CALCULATE INITIAL COSTS OF WEAK LINK GEAR MODIFICATION UNDER ALTERNATIVE 2



Note: The material cost used in this example represents the average cost of the various weak link materials that commercial fishermen might install. Similarly, the number of trawls per vessel and number of toggles per trawl used in the calculation of quantity of material required represent the average of typical gear configurations employed by Northern Nearshore lobster trap/pot vessels.

- **Buoy Line Modification -** The top two-thirds of buoy lines must be made entirely of sinking and/or neutrally buoyant line. This modification is unique to the DAM provisions and therefore would not otherwise be incurred.

- **Weak Link Modification** - Weak links with a maximum breaking strength of 1500 pounds (600 pounds outside of Offshore and the Great South Channel Restricted Area that overlaps with LMA 2/3 Overlap and LMA 3) must be placed on all floatation and/or weighted devices attached to a buoy line. This modification, however, is required under all proposed alternatives and therefore is not unique to the DAM provisions.

Calculation of Gear Modification Costs: Phase-in Costs

Phase-in costs include the incremental gear conversion costs that fishermen would incur between promulgation of a final rule and full implementation of the rule's provisions several years later (e.g., between promulgation of the final rule and 2008). For example, under Alternatives 2 through 4 and 6, Northern Nearshore lobster trap/pot vessels would have until 2008 to convert their groundline from floating line to sinking and/or neutrally buoyant line.[7] Phase-in costs are calculated as the sum of material and labor costs for each gear modification required (e.g., the material and labor cost of installing sinking and/or neutrally buoyant line), minus the costs that fishermen would ordinarily incur in the routine replacement of worn-out gear (e.g., the material and labor costs of replacing floating groundline).[8]

The provision of a phase-in period is designed to mitigate the cost of gear conversion and to give fishermen additional time to bring their gear into compliance. A key consideration in calculating the costs of converting gear during the phase-in period is the normal replacement cycle for such gear. If the phase-in period requires fishermen to replace gear more rapidly than they otherwise would, the cost of compliance will be greater than would be the case if the phase-in period allowed gear to be replaced on its normal schedule. Exhibit 6-4 illustrates this point for the replacement of floating groundline with non-floating groundline. In this example, floating groundline has an expected useful life of five years, which means, on average, that fishermen will replace 20 percent of their line each year.[9] Under a three-year phase-in period, the replacement of groundline would be accelerated to an average of 33 percent each year.[10] The increase in the rate of replacement (in this example, 13 percent per year) represents an additional

[7] Alternative 5 does not allow a phase-in period for any requirements; as a result, phase-in costs would not apply under Alternative 5.

[8] Appendix 6C-1 provides the material and labor costs for both floating and non-floating line types.

[9] NMFS gear specialists indicate that the useful life of floating groundline may range from five to ten years, depending on the fishery, the condition of the sea bottom, and weather conditions.

[10] The analysis assumes that fishermen would convert an equal amount of line over each year of the phase-in period provided in the regulations.

expenditure on gear during the phase-in period and a cost attributable to the new regulatory requirements.

Exhibit 6-4

EXAMPLE: ACCELERATED REPLACEMENT OF GROUNDLINE

	Year		
	1	**2**	**3**
Baseline replacement schedule of floating groundline	20%	20%	20%
Phase-in replacement schedule of non-floating groundline	33%	33%	33%
Gear replacement in excess of normal operations	13%	13%	13%
Note: Year one represents the first year that the rule becomes effective. Year three represents the last year of the phase-in period.			

Calculation of Gear Modification Costs: Ongoing Costs

Ongoing costs include all costs related to gear modifications that fishermen would incur on an annual basis following full implementation of new ALWTRP requirements. For gear modifications that fishermen make yearly (e.g., replacement of worn out fishing line), the ongoing costs attributable to changes in the ALWTRP equal the difference between annual replacement costs under the new standards and annual replacement costs under current standards. A key consideration in this calculation is accounting for differences in the gear's expected useful life. For example, floating groundline can last between five to ten years, depending on gear maintenance practices, sea bottom topology, weather, and other conditions. Non-floating groundline, such as sinking and/or neutrally buoyant line, is expected to have a shorter useful life because of increased contact with the sea bottom. A shorter useful life will result in fishermen having to replace more fishing line each year.

For gear modification materials that fishermen purchase and install periodically, such as weak link devices, ongoing costs are calculated as the material and labor costs amortized over the expected useful life of the gear component.[11] Appendix 6-C provides information on the useful life estimates employed in amortizing such costs.

Example: Modification Costs for Northern Nearshore Lobster Fishermen

Exhibit 6-5 illustrates the calculation of gear modification costs for a Northern Nearshore lobster trap/pot vessel. Under Alternatives 2 through 4, Northern Nearshore lobster trap/pot vessels would be required to (1) mark all buoy lines with a four inch mark every ten fathoms, and (2) by 2008, convert all groundline from floating groundline to sinking and/or neutrally buoyant groundline. The gear marking provision would become effective six months after publication of the final rule, and thus represents an initial cost. The cost of gear marking, however, would not be limited to this initial time period; each time a buoy line is replaced, the

[11] Amortizing refers to the process of equally distributing the cost of an investment over the time the material is used and accounting for the opportunity cost of the up-front investment.

new buoy line would also need to be marked. This latter cost would be incurred on an ongoing basis.

Exhibit 6-5

EXAMPLE: EXPECTED TIMING OF GEAR MODIFICATION COSTS FOR NORTHERN NEARSHORE LOBSTER VESSELS

		Year				
Regulatory Cost	**Type**	**1**	**2**	**3**	**4**	**5…**
Gear Marking	Initial	x				
	Ongoing		x	x	x	x
Groundline	Phase-in	x	x	x		
	Ongoing				x	x

Note: Year one represents the first year the final rule becomes effective. Year three represents the last year of the phase-in period.

The analysis assumes that the costs associated with conversion to non-floating groundline would be incurred over a three-year period between promulgation of the final rule and 2008, when the requirement would take effect. Thus, this cost is reported as a phase-in cost. Like the gear marking provision, however, the costs associated with the use of non-floating groundline would not be limited to the phase-in period; additional costs would be incurred each time the groundline is replaced. Again, the latter cost would be incurred on an ongoing basis.

Assumptions and Caveats

The analysis of gear modification costs is based on a number of assumptions. The most significant assumptions are noted below. Appendix 6-D summarizes additional assumptions and notes their implications for the analysis.

- **Gear quantity and configuration estimates represent typical vessel characteristics**: The estimates of gear modification costs directly depend on the quantity and configuration of gear that each model vessel employs. The analysis assumes that each model appropriately characterizes, at a general level, the configuration of gear employed by the vessels it is designed to represent. As a result of variation in gear use within each group, gear modification costs for individual vessels may vary significantly.

- **Material cost and labor cost estimates represent typical vessel costs**: The analysis also depends on the cost parameters the gear modification analysis employs, including estimates of the unit cost of materials, the useful life of materials, and the time required to implement particular modifications. Changes in these parameters would have a direct effect on the estimated cost of complying with gear modification requirements.

6.1.2.2 Gear Loss Costs

In addition to gear modification costs, potential changes in ALWTRP requirements could result in an increase or decrease in the rate of gear loss that vessels experience. According to discussions with NMFS gear specialists, as well as public comments submitted during the EIS scoping process, a variety of factors contribute to gear loss in the lobster trap/pot, other trap/pot, and gillnet fisheries, including:

- **Bad Weather** – High winds and rough seas can separate surface buoys from gillnets or trap/pot trawls, and are a common cause of gear loss.

- **Gear Conflicts** – Interactions between the gear employed by fishing vessels, such as the severing of a buoy line by a dragger, are another common source of gear loss.

- **Vessel Traffic** – Buoy lines can also become separated from gillnets or trap/pot trawls due to entanglement with passing vessel traffic.

- **Gear Fouling** – Buoy line and groundline can also become snagged on the ocean floor. As snagged gear is hauled to the surface, the line can break and gear may be lost.

This section describes potential changes in gear loss that might result from gear modifications and summarizes the approach used to analyze the associated costs.

Potential Increases in the Rate of Gear Loss

Exhibit 6-6 summarizes potential changes to the ALWTRP that may contribute to gear loss and notes whether the resulting loss is expected to be significant. A discussion of each provision and its potential impact on gear loss follows this exhibit.

Weak Links

Gear research indicates that the installation of weak links as required by the ALWTRP is unlikely to increase the rate of gear loss. Several weak link requirements have been implemented under previous ALWTRP measures, but few problems have been reported to NMFS regarding the failure of any of these devices (NMFS, 2002). In addition, the NMFS Gear Research Team has conducted a series of research projects to test the amount of strain placed on buoy systems when used in typical conditions at different locations; all tests have confirmed that weak links at the required breaking strength should not contribute to any significant additional gear loss (Kenney, 2003).

Exhibit 6-6

POTENTIAL SOURCES OF INCREASED GEAR LOSS

Regulatory Provision	Risk Factor				Impact on Gear Loss Rate
	Bad Weather	Gear Conflicts	Vessel Traffic	Gear Fouling	
Weak links at surface buoys	•	•	•		NS
Weak links on net panels	•				NS
Conversion of groundline to sinking and/or neutrally buoyant line				•	MS[1]
Conversion of buoy line to sinking and/or neutrally buoyant line				•	S
Conversion of buoy line to sinking and/or neutrally buoyant line, except the bottom third				•	NS
One buoy line per trawl for trawls of four or fewer traps/pots [2]	•	•	•		NS
One buoy line per trawl for trawls of greater than four traps/pots	•	•	•		S

Key:
NS = Not Significant
MS = Moderately Significant
S = Significant

Notes:
[1] The magnitude of this impact will vary depending on the location of a vessel's fishing activity (e.g., gear loss may be more significant in rocky bottom areas).
[2] Most commercial fishermen already use only one buoy line for trawls of four or fewer traps/pots. Since a limit to one buoy line in this case would not require most fishermen to change the configuration of their gear, the requirement should have no significant effect on gear loss rates.

Non-Floating Groundline

Regulatory provisions that require vessels to convert from floating groundline to non-floating groundline could lead to increased gear loss as a result of line wrapping around rocks or other marine debris. If the line becomes caught on the sea floor, the line may break as it is hauled to the surface. The impact of this provision on gear loss for lobster trap/pot and other trap/pot vessels is expected to be moderately significant. Gillnet vessels, however, are not expected to experience any significant additional gear loss from this provision, as groundline for gillnet gear systems is limited to line between the last net panel and an anchor device.

Non-Floating Buoy Line

A significant increase in gear loss is expected from the conversion of floating buoy line to non-floating buoy line. Although sinking line is often used at present in the top portion of buoy line, floating buoy line is almost always used at the bottom to ensure that it does not wrap around rocks or other debris on the ocean floor. Alternatives 2 through 4 would require other trap/pot vessels fishing in SAM waters to use buoy lines made entirely of non-floating buoy line

until SAM is eliminated in 2008. This gear modification is expected to result in increased snagging of buoy line on ocean debris and could therefore lead to increased gear loss.[12]

One Buoy Line for Trawls of Four or Fewer Traps/Pots

Another provision of the regulatory alternatives under consideration would restrict vessels in Northern Nearshore waters, Stellwagen Bank/Jeffrey's Ledge, and in Cape Cod Bay Restricted Area from May 16 to December 31 to one buoy line for trawls of four or fewer traps/pots. This provision, however, is not expected to have any significant impact on gear loss. The NMFS Gear Research Team reports that typical gear configurations for trap/pot vessels include singles, doubles, and triples. For these gear configurations, most fishermen already use only one buoy line per trawl.

One Buoy Line in SAM Waters

Under Alternatives 2 through 4, other trap/pot vessels operating in SAM waters would be limited to one buoy line per trawl; as a result, such vessels could incur additional gear loss. An analysis of NMFS data indicates that of other trap/pot fisheries, only hagfish vessels are found in SAM waters during the restricted time period. Even when operating with two buoy lines per trawl, hagfish vessels operating in this area commonly lose surface gear to bad weather and gear conflicts with other fishermen or passing ship traffic. If restricted to one buoy line per trawl, hagfish vessels operating in this area are expected to lose significantly more fishing gear.

Potential Reductions in the Rate of Gear Loss

Some provisions of the regulatory alternatives under consideration have the potential to reduce current gear loss rates. For example, gear loss for lobster trap/pot vessels fishing in SAM waters would be expected to decrease if such vessels are allowed to employ a second buoy line on their trawls. Similarly, lobster trap/pot vessels fishing in SAM waters could experience a reduction in gear loss if a change in regulations would allow floating line to be used in the bottom one-third portion of their buoy line. These potential changes are discussed further below.

Trawls Allowed a Second Buoy Line

Current regulations for lobster trap/pot vessels fishing in SAM waters restrict trawls to the use of one buoy line. This restriction would be eliminated beginning in 2008 under Alternatives 2 through 4 and six months after promulgation of new regulations under Alternatives 5 and 6. Consequently, lobster trap/pot vessels fishing in SAM waters that fish

[12] Alternatives 5 and 6 do not require vessels in SAM waters to install non-floating groundline in the bottom third of the buoy line. Similarly, restrictions on other trap/pot vessels in Northern Nearshore waters, Stellwagen Bank/Jeffrey's Ledge, and Cape Cod Bay from May 16 to December 31 only require the top two-thirds of the buoy line to be non-floating line. These less restrictive requirements are not expected to result in increased gear loss since floating line is less prone to gear fouling.

more than four trap/pots per trawl would be allowed to employ two buoy lines.[13] Restricting vessels to one buoy line per trawl is considered a significant source of gear loss; with the elimination of this restriction, lobster trap/pot vessels operating within SAM waters would likely experience a reduction in current gear loss rates.[14]

Floating Line Allowed in the Bottom One-Third of the Buoy Line

Current regulations for lobster trap/pot vessels fishing in SAM waters require buoy lines to be made entirely of and/or neutrally buoyant line. This restriction would be eliminated beginning in 2008 under Alternatives 2 through 4 and six months after promulgation of new regulations under Alternatives 5 and 6, allowing the bottom third of the buoy line to be composed of floating line. As described above, the use of sinking and/or neutrally buoyant line over the full length of the buoy line is considered to be a significant source of gear loss. Thus, the relaxation of this restriction for lobster trap/pot vessels fishing in SAM waters is expected to result in significant reductions in the rate of gear loss.

Analysis of Gear Loss Impacts

Exhibit 6-7 identifies the regulatory provisions that could affect gear loss for lobster and other trap/pot vessels.[15] Because research on the effect of changes in gear configurations is not complete, gear experts cannot estimate with confidence the change in gear loss that would result from compliance with these provisions. In the absence of better data, the analysis employs the assumed change in gear loss rates specified in Exhibit 6-8. These assumptions were developed by the NMFS Gear Research Team, and reflect the combined impact of the regulatory provisions incorporated under Alternatives 2 through 6. They also reflect differences in the impact of the regulations in different locations.[16] Appendix 6-E summarizes the lobster and other trap/pot equipment costs applied in the analysis of gear loss costs.

[13] Under all regulatory alternatives, lobster trap/pot vessels fishing in the SAM waters that overlap with Northern Nearshore waters and Stellwagen Bank/Jeffrey's Ledge would still be limited to one buoy line for trawls of four or fewer traps/pots.

[14] Although gillnet vessels would also be allowed to employ two buoy lines, NMFS gear specialists do not expect this provision to result in a change in the rate of gear loss.

[15] The regulatory alternatives under consideration are expected to have no impact on gear loss in the gillnet fishery.

[16] NMFS gear specialists estimate current gear loss rates of between five and ten percent per year for lobster and other trap/pot fisheries, depending on fishing location; vessels fishing in shallower waters likely experience the lower rate of loss, while offshore areas likely experience the higher rate.

Exhibit 6-7

VESSELS AFFECTED BY REGULATORY PROVISIONS THAT MAY CHANGE GEAR LOSS RATES

Regulatory Provision	Impact on Gear Loss	Affected Vessels		
		Alternatives 2 through 4	Alternative 5	Alternative 6
Conversion of groundline to sinking and/or neutrally buoyant line	Increase	▪ Lobster Trap/Pot[1] ▪ Other Trap/Pot	▪ Lobster Trap/Pot in revised SAM waters ▪ Other Trap/Pot in SAM waters	▪ Lobster Trap/Pot [1] ▪ Other Trap/Pot
Conversion of buoy line to sinking and/or neutrally buoyant line	Increase	▪ Other Trap/Pot in SAM waters[2]	▪ NA	▪ NA
One buoy line per trawl	Increase	▪ Other Trap/Pot in SAM waters[2]	▪ NA	▪ NA
Second buoy line allowed	Decrease	▪ Lobster Trap/Pot in current SAM waters[3]	▪ Lobster Trap/Pot in current SAM waters	▪ Lobster Trap/Pot in current SAM waters
Floating line allowed in the bottom one-third of the buoy line	Decrease	▪ Lobster Trap/Pot in current SAM waters[3]	▪ Lobster Trap/Pot in current SAM waters	▪ Lobster Trap/Pot in current SAM waters

Notes:

[1] This change does not apply to vessels fishing in ALWTRP-regulated waters that were required to convert all groundline to non-floating line in 2002.

[2] This change applies only while the SAM program is in place (i.e., from 2005*-2007); thereafter, the requirement to use sinking and/or neutrally buoyant line in SAM waters would be eliminated.

[3] Beginning in 2008.

* Please note that the date of January 1, 2005 was selected for the purpose of analyzing the impacts of the proposed alternatives in this DEIS. However, the implementation of regulations associated with this date in the DEISwould become effective six months after publication of a final rule.

Exhibit 6-8

ESTIMATED CHANGE IN ANNUAL GEAR LOSS RATES BY FISHING LOCATION AND ALTERNATIVE

Fishing Location	Estimated Change in Annual Gear Loss Rate		
	Alternatives 2-4	**Alternative 5**	**Alternative 6**
Lobster			
Nearshore/Inshore[1, 2]	+ 5%	0	+ 5%
Offshore[1]	+ 5%	0	+ 5%
Maine Inshore waters	+ 10%	0	+ 10%
Nearshore, Current SAM waters	- 5%[3]	- 5%	- 5%
Offshore, Current SAM waters	- 5%[3]	- 5%	- 5%
Nearshore, Revised SAM waters	NA	+ 5%	+ 5%
Offshore, Revised SAM waters	NA	+ 5%	+ 5%
Other Trap/Pot			
Nearshore/Inshore	+ 5%	0	+ 5%
Offshore	+ 5%	0	+ 5%
Nearshore, SAM waters	+ 10%[4]	+ 5%	+ 5%[4]
Offshore, SAM waters	+ 10%[4]	+ 5%	+ 5%[4]

Notes:
1 Excluding those vessels fishing in SAM waters that were required to convert all groundline to non-floating line in 2002.
2 Excluding lobster trap/pot vessels fishing in inshore waters off the coast of Maine, which would experience higher rates of gear loss from using non-floating groundline on the rocky sea floor that makes grappling for lost gear difficult.
3 Beginning in 2008.
4 Until 2008; thereafter, the change in gear loss estimated for other areas would apply.

6.1.2.3 Additional Fishing Restrictions and Closures for Gillnet Vessels

In addition to gear modifications, the potential changes to the ALWTRP include a range of restrictions on the fishing practices of some gillnet vessels. As explained below, the costs of these restrictions are believed to be minimal and are not quantified in this analysis. Restrictions to gillnet fishing practices include:

- **Night Set Restrictions** – This requirement could take one of two forms: (1) no fishing with driftnet gear at night unless gear is tended; or (2) no straight sets of gillnet gear at night.

- **Gear Stowing Requirement** – This provision would require that driftnet gear be removed from the water and stowed on board the vessel before returning to port.

- **Spotter Plane Requirement** – This provision would require certain vessels to set their nets under the observation of a spotter plane.

- **Whale Approach Requirement** – This provision would prohibit a vessel from setting its nets within three nautical miles of a right, humpback, or fin whale. If a right, humpback, or fin whale were to approach within three nautical miles of set gear, the responsible vessel would be required to immediately remove that gear from the water.

- **Monitoring Requirement** – This provision would prohibit certain vessels from fishing without an installed Vessel Monitoring System.

- **Closures** – Closure provisions would prohibit fishing with specified gear in a specified area during a specified time period.

Appendix 6-F provides tables identifying vessels that would be subject to each of the provisions listed above, and the time periods during which each provision would apply. As the appendix indicates, the prohibition against fishing straight sets at night applies to all gillnet vessels (whether anchored or drift) fishing in the Southeast; the other restrictions apply primarily to driftnet vessels, including shark vessels.

The extent to which these requirements would impose additional costs on fishermen depends on the magnitude of the changes that fishermen would be required to undertake in order to comply. Costs would be incurred only if the regulatory alternatives require measures more stringent than those required under the existing ALWTRP or different than a vessel group's standard fishing practices. In addition, costs that are only incurred by a small number of vessels may not be significant when compared to the total cost of each of the proposed alternatives. In light of these considerations, the analysis assumes that these requirements would not impose significant costs to affected gillnet vessels.

The analysis assumes that fishing restrictions and closures would impose no additional costs on driftnet vessels in the Northeast and Mid-Atlantic, based on the following rationale:

- **The requirements are identical to current practice** – The regulatory alternatives under consideration would prohibit fishing with driftnet gear at night unless that gear is tended. Because driftnets may drift away, these nets are always tended; thus, vessels are unlikely to incur additional costs due to this restriction. Similarly, the requirement that driftnet gear be removed from the water and stowed on board the vessel before returning to port would have no material effect on driftnet vessels, since driftnets are never left untended. Thus, this requirement would impose no additional costs.

- **There is no significant driftnet fishery in the Northeast** – The regulatory alternatives would prohibit driftnet vessels from fishing in the Cape Cod Bay and Great South Channel restricted areas during restricted periods. Because no driftnet fishing occurs in the Great South Channel and very little driftnet fishing occurs in Cape Cod Bay (what exists is

primarily elective bait fishing by lobstermen), the closure of these restricted areas would have no significant cost impact.

The regulatory alternatives under consideration would also impose several changes affecting directed shark vessels, including extension of the existing restricted area south and east, the introduction of a shortened but rolling restricted period over part of the restricted area, the imposition of "whale approach" requirements, and a requirement that vessels use a Vessel Monitoring System (VMS).[17] The costs of these requirements per shark vessel are not expected to be significant – and are, therefore, not quantified in this analysis – for the following reasons:

- **Number of affected vessels is small** – Data from NMFS' 2002 Southeast Logbook program indicate that three vessels fished for shark during the restricted times in the Southeast ALWTRP management areas. Based on available information, it cannot be determined whether these vessels were strikenetting, an activity that is exempt from some ALWTRP fishing restrictions. Nonetheless, the available data suggest that the number of shark vessels whose activities might be constrained by new ALWTRP requirements in the southeast is likely to be small.

- **No costs from expansion of the restricted area** – The extension of the restricted area southward is unlikely to impose any costs on shark fishermen because they routinely fish south of the restricted area during the restricted period. The extension of the restricted area eastward would be unlikely to impose additional costs because shark vessels typically do not venture farther offshore than the existing Southeast ALWTRP management area boundaries.

- **No costs due to change in restricted time periods** – The shift in the start of the restricted period from November 15 to December 1 would not likely result in significant benefits or costs for shark vessels because activity within the large coastal shark fishery does not routinely begin until January 1. Although vessels are permitted to fish for small coastal sharks from November 15 to December 1, market prices are such that fishermen target mackerel, not coastal sharks, at that time.

- **Costs of "whale approach requirement" are likely to be small** – The requirement to move/remove gear when a whale approaches could impose costs in the form of the time required to make additional net hauls. The magnitude of these costs would depend on the frequency with which whales approach shark (driftnet) vessels. The frequency of such approaches is unknown but believed to be rare; thus, the analysis does not attempt to quantify the corresponding compliance costs. To the extent that

[17] This analysis assumes that the only driftnet vessels operating in the Southeast are shark vessels, given the ALWTRP definition of anchored gillnets. To the extent that there are other driftnet fisheries in the Southeast, the final cost estimate may understate actual costs.

the whale approach requirement might impose costs on shark (driftnet) vessels in the Southeast, the final cost estimate may understate actual costs.

- **Vessel Monitoring System costs are likely to be small** – As the result of Amendment 1 to the Highly Migratory Species Fishery Management Plan (68 FR 74746, 69 FR 19979, and 69 FR 28106)), shark gillnet vessels will be required to operate vessel monitoring systems (VMSs) during the right whale calving season of November 15 to March 31. On May 18, 2004, a rule was published (69 FR 28106) that proposes an effective date of November 14, 2004, for the requirement to have a NOAA-approved VMS unit installed and operating on shark gillnet vessels. Under the ALWTRP, however, shark vessels fishing in the Southeast U.S. Restricted and Southeast U.S. Observer Areas[18] will be required to continue operating the VMS between April 1 and April 15. The incremental cost of replacing observer coverage with a VMS in the ALWTRP is the daily operating cost of the VMS for the days that shark vessels fish in the monitoring areas outside of the right whale calving season. The daily operating cost of a VMS is $1.44 per day (NMFS, 2003). To the extent that a shark vessel fishes during the time and area specified, costs would range between $1.44 and $21.60 per vessel (depending upon the number of days fished during the regulated period). Given the uncertainty regarding whether fishermen would operate within the applicable period, the analysis does not incorporate these costs into the estimated costs of complying with potential revisions to the ALWTRP.

6.1.3 Number of Vessels Affected by the Regulatory Alternatives

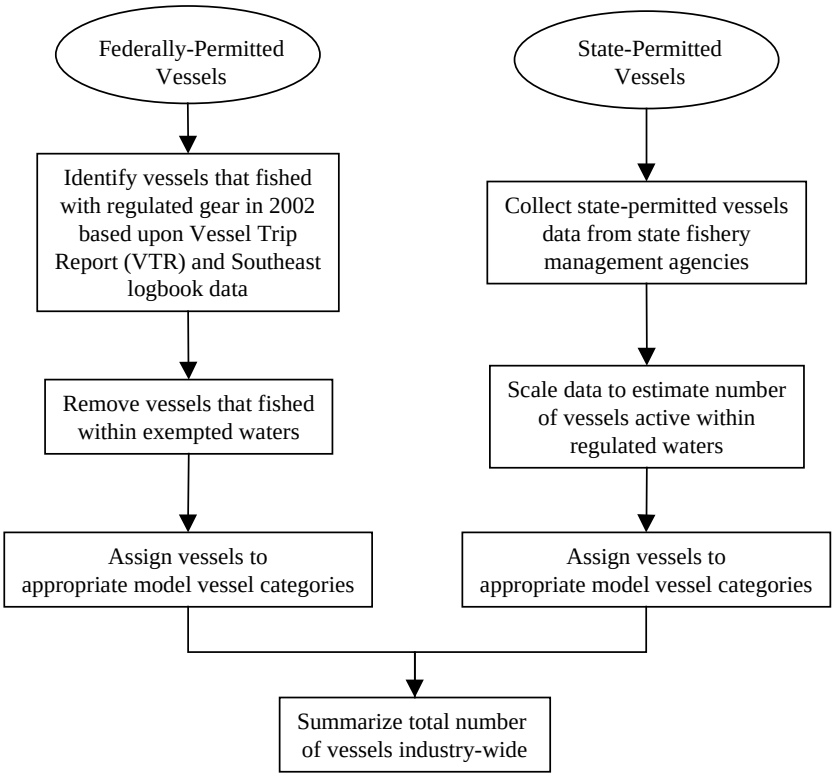
Once compliance costs for the model vessels are calculated, the next step in the analysis is to estimate the number of vessels represented by each model vessel (i.e., the number of vessels within a particular category). As Exhibit 6-9 shows, the analysis uses data on Federal and state-permitted vessels to estimate the number of vessels to assign to each category. For each source, the analysis identifies vessels that have actively fished with the applicable gear types and might therefore be affected by changes to the ALWTRP. After identifying and removing those vessels that operate within waters that are exempt from the requirements, each of the remaining vessels

[18] Under Alternatives 2 through 6, for shark gillnet fisheries, the portion of the Southeast U.S. Restricted Area overlapping the Southeast U.S. Observer Area north of 27°51' N would be renamed the Northern Monitoring and Restricted Area, and the portion of the Southeast U.S. Observer Area south of 27°51' N, would be renamed the Southern Monitoring Area. For non-shark gillnet fisheries, these waters north of 27°51', where gillnetting occurs, would be designated as "Other Southeast Gillnet Waters." To avoid confusion in comparing current regulatory requirements to those under each alternative, this document retains the original nomenclature.

is assigned to the appropriate model vessel category (refer to Appendix 2A for a description of exempted waters under the current ALWTRP). This approach is summarized in greater detail below.[19]

Exhibit 6-9

METHODOLOGY EMPLOYED TO ESTIMATE THE NUMBER OF VESSELS AFFECTED BY THE REGULATORY ALTERNATIVES



6.1.3.1 Analysis of Federally-Permitted Vessels

The regulations governing many of the fisheries that NMFS administers require permit holders to report regularly on their commercial fishing activities. NMFS' two primary sources of information on vessel activity in Atlantic waters are the Northeast Vessel Trip Report (VTR) system and the Southeast Logbook program.

[19] Bisack (2003) conducted a similar analysis using 1999 commercial fishing data and serves as a template for this study. The approach used in this analysis, however, expands the study area to Southeast waters (using Southeast Logbook data) and identifies fishing location at a finer level of detail in order to assign vessels to the appropriate model vessel category.

- **Vessel Trip Reports**: Most commercial fishing permits administered by NMFS' Northeast Regional Office (NERO) require fishermen to file a Vessel Trip Report (VTR) at the conclusion of every trip.[20] The VTR provides information on the gear the vessel employed, the area(s) in which it fished, the port at which its catch was landed, landings by species, and ex-vessel revenue by species. Information from these reports is compiled in NERO's VTR database. Unlike most permits administered by NERO, Federal lobster permits impose no trip report requirements. As a result, the VTR database typically does not contain information on the activity of vessels that hold a Federal lobster permit but no other Federal permit. Information on vessels that hold Federal lobster permits is limited to those that also hold permits for other fisheries that impose VTR requirements; these vessels must report all fishing activity to NERO.[21]

- **Logbook Reports**: Vessels holding permits for many of the fisheries managed by the Southeast Regional Office (SERO) – including South Atlantic snapper-grouper, King and Spanish mackerel, and shark – are required to submit a logbook report for each fishing trip.[22] The information required by the Southeast logbook program is similar to that required by the Northeast VTR system. The Southeast program, however, does not require vessels to provide information on the value of their landings. Thus, Federal data on ex-vessel revenues for fisheries administered by SERO are unavailable.

Because compliance with vessel trip reporting requirements is incomplete, both the VTR data and Southeast logbook program likely under-report total fishing activity. In addition, the data provided may be compromised by imprecision or inaccuracy on the part of those who file the report, or by the limitations of the data collection instruments.[23] Despite these limitations, the VTR and logbook programs provide the best available data on commercial fishing activity in the Atlantic EEZ, and thus the best basis for analyzing the economic impact of potential changes to the ALWTRP.

[20] Technically, the regulations require fishermen to submit separate reports for each statistical area and type of gear fished. In practice, many fishermen compile all information for a single trip on one form.

[21] In 2002, 2,735 vessels held a Federal lobster permit. Of these, 43 percent (1174) did not hold a permit to fish for other species and therefore did not need to file vessel trip reports. This percentage varies geographically, with 48 percent of vessels permitted to lobster in nearshore waters holding no other permits, compared to 33 percent of vessels permitted to lobster in offshore waters.

[22] Fisheries managed by SERO that are not subject to reporting requirements include the South Atlantic rock shrimp and gulf shrimp fisheries.

[23] For example, the logbook program provides for the designation of only one type of gear per species caught; thus, if a vessel catches a species with more than one type of gear on a single trip, some portion of the catch may be attributed to the wrong gear. Similarly, the location reported on a VTR may indicate the primary location at which a vessel fished, but not necessarily the sole location.

The model developed to estimate the number of vessels affected by the regulatory alternatives uses these sources by first compiling data on commercial fishing trips in 2002 that used the regulated gear types.[24] For each source, the model then summarizes the data to identify the fishing activity of individual vessels.

Excluding Exempt and Minimally Active Vessels

Under each of the alternatives considered in this analysis, vessels that operate within sheltered bays and other inshore waters are exempt from regulatory requirements (see Appendix 2A for a description of exempted areas under the current ALWTRP). To identify vessels that operate primarily within exempted waters of the Northeast, spatial analysis of VTR-based trip data was employed; this analysis identified vessels that reported 50 percent or more of their trips within exempted areas. The analysis assumes that these vessels will not make the required gear modifications and will instead make all future trips within exempted waters.[25] Because Southeast Logbook reports provide only the approximate area of each trip, the analysis of Southeast fishing data cannot identify individual vessels that operate only within the inshore waters exempt from the regulatory alternatives.[26] When compared to the Northeast waters, however, a much smaller portion of Southeast waters are exempted. Consequently, for vessels identified via Southeast Logbook data, the model assumes that all federally-permitted vessels operate and will continue to operate outside exempted areas.

Vessels that fish within seasonally exempted waters during the applicable time periods are also excluded from the analysis. For the analyses of Alternatives 3, 4, 5, and 6, vessels that operate exclusively within seasonally exempted waters during the applicable period are excluded. Vessels that operate within the non-exempt time period, regardless of whether they also operate during the exempt period, are assumed to make all gear modifications required by the regulatory provisions and incur the full associated compliance costs.

The analysis also excludes vessels that would be minimally affected by changes to ALWTRP regulations. For example, some fishermen occasionally fish a few traps/pots to catch species used for bait in their primary fishing activity. The model assumes that vessels fishing less than four trips using the gear subject to ALWTRP requirements would incur only minimal compliance costs; these vessels are excluded from the analysis.

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[24] The analysis excludes party and charter boat trips, which are exempt from ALWTRP requirements.

[25] The analysis excludes vessels that are assumed to operate only within exempted waters, as defined by each of the regulatory alternatives under consideration. To the extent that this approach excludes vessels that are currently subject to ALWTRP requirements but would no longer be subject to such requirements as a result of expansion of the exempted areas, the analysis ignores a potential reduction in ALWTRP compliance costs. The magnitude of the costs savings, however, would be minimal. For example, the analysis suggests that 52 federally permitted lobster trap/pot vessels would be exempted from the requirements of the Take Reduction Technology List. If these vessels no longer installed weak links on all buoy lines, the individual vessel savings would be approximately $31 per year for vessels fishing trawls and $153 per year for vessels fishing pairs.

[26] Commercial fishermen reporting data via the Southeast Logbook indicate their approximate fishing location according to statistical grid areas that are delineated by degrees of latitude and longitude.

Assigning Active Vessels to Vessel Groups

As described above, a major factor determining the cost of complying with each alternative is the location of fishing activity. Consequently, spatial analysis of the VTR and Southeast logbook data was employed to determine the location of each fishing trip reported in 2002.[27] The analysis then summarized the data to characterize vessel activity by fishery, season, and location, providing a basis for assigning each vessel to a particular category. Because vessels often operate in multiple areas, the analysis prevents double-counting of vessels by distributing equal proportions of each vessel to the applicable model vessel category.[28] For example, in the case of a vessel that fishes in both the SAM and other Northeast waters, half a vessel is assigned to each area. For a vessel operating in three areas, one-third is assigned to each area.[29]

Within the other trap/pot fishery, commercial fishermen often maintain and use different types of gear to target different species. Thus, the analysis assumes that each vessel maintains separate sets of gear for each species it targets. For example, a vessel that targets both black sea bass and hagfish would incur the cost of modifying two sets of gear. Because the cost of complying with the regulatory alternatives varies based on species targeted, each vessel's targeted species is determined based on VTR catch data. For each trip, the species with the maximum landed weight is identified. A vessel is assumed to target each of the species that were the primary catch for at least ten percent of the vessel's trips.

Because the analysis described above does not capture all active federally-permitted vessels, the estimate of affected vessels also relies on two supplementary sources of information:

- **Federally-permitted vessels not requiring VTR reports**: Fishermen who hold only a Federal lobster permit are not required to submit vessel trip reports. To identify such vessels, the analysis relies on NMFS' Northeast Permit Database. Because some fishermen, however, maintain a Federal permit but do not actively fish, the analysis estimates the number of such vessels that are active by scaling the total number of permitted

[27] GIS analysis of the VTR data identifies the fishery management areas where each trip occurred. For the Southeast Logbook data, locations are identified based upon the South Atlantic statistical grid areas reported by fishermen and the corresponding overlap with fishery management areas.

[28] By distributing an equal proportion of each vessel to the appropriate model vessels, the analysis implicitly assumes that vessels are fishing the same amount of gear in each area.

[29] According to NMFS gear specialists, commercial lobster trap/pot fishermen operating within inshore waters may employ two different gear configurations: pairs (one to three lobster trap/pots attached to one buoy line) and trawls (more than four trap/pots attached to two buoy lines). To address this difference, the analysis assumes that half of all lobster trap/pot vessels operating in inshore waters fish each of these configurations.

vessels by the proportion of other permitted lobster trap/pot vessels (i.e., those vessels required to report to VTR) that actively fished in 2002.[30]

- **VTR data that lack location information**: Some trips recorded in the VTR database do not indicate where the activity took place. To ensure that these vessels are included in the analysis, the model compares the hull identification numbers identified in the trip reports with those identified in the primary VTR data analysis described above. For previously unidentified vessels, the analysis assumes that the vessels' operations are distributed among the vessel groups in the same proportion as vessels included in the primary VTR analysis.

6.1.3.2 Analysis of State-Permitted Vessels

Each state has the authority to manage fishing activity within its territorial waters.[31] Vessels that hold permits to fish in both state and Federal waters are subject to the Federal reporting requirements described above; however, vessels that hold permits to fish solely in state waters are not required to submit VTR or logbook reports. To obtain information on vessels in this group that may be affected by ALWTRP regulations, NMFS contractors conducted telephone interviews with representatives of state commercial fisheries management agencies. Appendix 6-G provides information on the results of these interviews.

The analysis of state-permitted vessels seeks to identify vessels that would be affected by ALWTRP requirements and are not already considered in the analysis of federally-permitted vessels. Consequently, for cases in which state officials were unable to provide estimates of the number of state-permitted vessels that actively operate, the analysis assumes that 25 percent of permitted vessels are active.[32] In addition, state officials were asked to estimate the number or percentage of state-permitted vessels that also hold Federal permits. These vessels were removed from the analysis of state-permitted vessels to avoid double-counting those already included in the analysis of federally-permitted vessels.[33]

To supplement data on state-permitted lobster trap/pot vessels, the analysis employs trap tag data to estimate the number of active vessels that are permitted by the states. Under the

[30] Permit categories identify the lobster management areas in which vessels may operate. Vessels with permits for multiple areas are distributed in equal fractions between areas. Where multiple regulatory groups (e.g., SAM, Cape Cod Bay critical habitat area) exist within a lobster management area, the permit data are applied to the distribution of vessels identified from the VTR data to estimate the number of vessels operating in each area.

[31] In general, state jurisdiction extends to waters within three nautical miles of shore.

[32] This assumption is based upon the approximate breakdown between permitted and active vessels in states for which both estimates are available.

[33] In cases where a state representative was unable to estimate the number or percentage of vessels that also possess Federal permits, the analysis assumes that none of the state's vessels are federally-permitted. To the extent that these vessels were active and appear in the VTR data, the analysis would double-count these vessels.

lobster Interstate Fishery Management plan developed by the Atlantic States Marine Fisheries Commission, commercial lobster trap/pot fishermen must purchase trap tags and install one on each trap/pot fished. The manufacturer of the trap tags, Stoffel Seals Corporation, maintains spreadsheets that summarize information on the number of tags purchased and contact information for each individual that requests tags. The analysis summarizes the data from these spreadsheets to determine the total number of commercial fishermen that purchased lobster trap tags to operate within state waters.[34]

Removing Exempted Vessels

Many state-permitted vessels operate within the sheltered bays and other inshore waters that are currently exempt from ALWTRP requirements or would be made exempt from such requirements under Alternatives 2 through 6 (see Appendix 2A for a description of exempted areas under the current ALWTRP, and Section 3.1.2 for a description of the exempted areas under the proposed requirements). Data on the location of state-permitted vessel activity is unavailable; consequently, the model estimates the number of vessels that fish only in exempted waters based upon the percentage of state waters that are within exempted areas. The analysis assumes that vessel activity is evenly distributed within state waters and reduces the number of active state-permitted vessels by applying these exempt water scalars. Exhibit 6-10 identifies the percentage of each states' waters that would be exempted from ALWTRP requirements under the new standards.

Exhibit 6-10

PERCENTAGE OF STATE WATERS WITHIN EXEMPTED AREAS

State	Percent Exempt
Maine	50%
New Hampshire	18%
Massachusetts	16%
Rhode Island	30%
Connecticut	100%
New York	69%
New Jersey	58%
Delaware	80%
Maryland	96%
Virginia	84%
North Carolina	74%
South Carolina	27%
Georgia	24%
Florida	28%

Source: Geographic analysis of exempt and state waters.

[34] To avoid double-counting lobster trap/pot vessels that are also federally-permitted, the state-based trap tag data are cross-referenced with Federal trap tag data and vessels already considered in the Federal vessel analysis are excluded.

The analysis also seeks to exclude state-permitted vessels that operate only within seasonally exempted waters during the applicable time periods. For the assessment of Alternatives 3, 4, 5, and 6, the analysis estimates the number of vessels that might be exempt by assuming that the proportion of vessels excluded is equivalent to the percentage of federally-permitted vessels exempted within the same ALWTRP management area (e.g., Southern Nearshore Lobster waters and Mid-Atlantic Gillnet waters).[35] Appendix 6-G summarizes the data obtained on fishery activity in state waters and the scalars applied to estimate the number of active vessels that would be affected by ALWTRP requirements.

Assigning Active Vessels to Model Vessel Groups

The analysis assigns the affected state-permitted vessels to model vessel categories in the same manner described above for federally-permitted vessels. In most instances, the ALWTRP regulations that would apply within state waters are uniform for all vessels in a particular fishery; in these cases, all state-permitted vessels in a given fishery are assigned to the same vessel category. In some instances, however (e.g., Massachusetts), the ALWTRP regulations that would apply to a particular fishery within state waters vary by location or season; thus, more than one vessel category applies. In these instances, the analysis equally distributes state-permitted vessels to all applicable vessel categories.

6.1.3.3 Assumptions and Caveats

The analysis of affected vessels is based on a number of assumptions. The most significant assumptions are noted below. Appendix 6-H summarizes additional assumptions and notes their implications for the analysis.

- **NMFS VTR and Southeast Logbook data adequately capture federally-permitted activity**: Aside from federally-permitted lobster trap/pot vessels, which are analyzed separately, the analysis assumes that commercial fishing activity within Federal waters is adequately summarized in VTR and Southeast Logbook data. To the extent that these data are incomplete, the analysis may underestimate the number of affected vessels.

- **Recent vessel activity is representative of future fishing activity**: The location and timing of fishing activity varies from year to year. The analysis is based on 2002 vessel activity data from the Southeast Logbook

[35] Based on this approach, within the lobster trap/pot fishery, 12.5 percent of vessels fishing within seasonally exempted waters are assumed to operate only during the exempt period and therefore, are excluded from the analysis. Within the other trap/pot and gillnet fisheries, 7.0 and 2.3 percent of vessels are assumed to operate within the seasonally exempted waters during the exempt period, respectively. These vessels are also excluded from the analysis.

and VTR systems, and assumes that these data are representative of activity in the future.[36]

- **Vessel activity is equally distributed across all ALWTRP areas in which a vessel is active**: If a vessel operates in multiple ALWTRP locations, the analysis of affected vessels distributes an equal fraction of the vessel to each area. To the extent that this approach is not representative of the actual distribution of the vessel's activity, it may mischaracterize the distribution of vessel activity within each model vessel category.

6.1.4 Calculation of Total Compliance Costs

The methods described above provide a basis for estimating the cost of complying with potential revisions to the ALWTRP. The analysis estimates compliance costs for each regulatory alternative under consideration. In each case, regulatory compliance costs for a given category of vessel (i.e., each group of vessels represented by a model vessel) are calculated by multiplying the estimate of compliance costs for the model vessel by the number of vessels the model represents. The sum of costs across all vessel categories within a particular fishery provides an estimate of regulatory compliance costs for that fishery; similarly, the sum of costs across all categories that operate within a given area (e.g., Northern Inshore waters) generates an estimate of compliance costs for that area. The sum of costs across all vessel categories provides an estimate of regulatory compliance costs for the industry as a whole.

6.2 ESTIMATED COSTS OF COMPLIANCE WITH POTENTIAL CHANGES TO THE ALWTRP

6.2.1 Comparison of Regulatory Alternatives

Exhibit 6-11 presents the results of the economic impact analysis for Alternatives 1 through 6. As the exhibit indicates, the incremental costs the alternatives would impose on the commercial fishing industry range from zero in the case of Alternative 1, the no action alternative, to approximately $14.2 million per year under Alternatives 2, 3 (Preferred), 4, and 6 (Preferred). In the case of Alternatives 2, 3 (Preferred), 4, and 6 (Preferred), the impact of the new standards on lobster trap/pot vessels accounts for approximately 90 percent of estimated compliance costs; impacts on gillnet vessels account for 7 percent of the total, and impacts on other trap/pot vessels account for the remaining 3 percent. Aside from Alternative 1, the only regulatory alternative that differs significantly from the others with respect to estimated

[36] A comparison of data from this study and Bisack (2003) shows a nine percent difference in the number of individuals from Maine, New Hampshire, Massachusetts, and Rhode Island who purchased lobster trap tags in 1999 (4,996) and 2003 (5,439). This may suggest an increase in effort in the lobster fishery; however, variations in methodologies and study area prohibit a more extensive analysis of potential changes in fishing activity.

economic impacts is Alternative 5. The analysis suggests that this alternative would impose incremental regulatory costs of approximately $1.0 million annually. In this case, the impact of the new standards on lobster trap/pot vessels accounts for approximately 76 percent of estimated compliance costs; impacts on gillnet vessels account for 17 percent of the total, and impacts on other trap/pot vessels account for the remaining 8 percent.

Exhibit 6-11

ESTIMATED INCREASE IN ANNUALIZED ALWTRP COMPLIANCE COSTS: ALL AFFECTED FISHERIES (2003 dollars)

Regulatory Alternative	Fishery			Total
	Lobster Trap/Pot	Other Trap/Pot	Gillnet	
Alternative 1 (No Action)	$0	$0	$0	$0
Alternative 2	$12,844,000	$440,900	$957,300	$14,242,200
Alternative 3 (Preferred)	$12,830,500	$438,100	$946,700	$14,215,300
Alternative 4	$12,844,000	$440,900	$955,600	$14,240,500
Alternative 5	$773,800	$76,500	$168,000	$1,018,400
Alternative 6 (Preferred)	$12,826,700	$394,000	$947,300	$14,168,100
Note: Totals may not sum due to rounding.				

The costs associated with Alternative 5 would be significantly lower than the costs associated with the other alternatives under consideration primarily because Alternative 5 would not impose as broad a set of gear modification requirements. In particular:

- Alternative 5 would not require vessels fishing outside of Cape Cod Bay (January 1 to May 15) or the Seasonal Area Management zone (March 1 to July 31) to convert their groundline to sinking and/or neutrally buoyant line. In contrast, Alternatives 2 through 4 and 6 would require most vessels fishing in waters addressed by the ALWTRP to convert to sinking and/or neutrally buoyant groundline.

- Alternative 5 would not make other trap/pot vessels subject to the requirements of the Dynamic Area Management program; this is in contrast to Alternatives 2 through 4, which would subject other trap/pot vessels to DAM requirements until 2008, when the DAM program would be eliminated.

- Alternative 5 would not require anchored gillnet vessels fishing outside the SAM zone to increase the number of weak links per net panel from one to five or more, depending on panel size, or would it require Northeast anchored gillnet vessels to secure their nets at each end with an anchor having the holding power (at minimum) of a 22-pound Danforth-style anchor. These provisions are in contrast to those incorporated into the other alternatives.

As a result of these differences, the cost that most vessels would face in complying with Alternative 5 is considerably lower, on average, than the cost they would face in complying with Alternatives 2, 3 (Preferred), 4, or 6 (Preferred).

In contrast to Alternative 5, the estimated compliance costs for Alternatives 2, 3 (Preferred), 4, and 6 (Preferred) are quite similar, reflecting similarities in most of the regulatory requirements the alternatives would impose. The compliance cost estimate for Alternatives 2 through 4 is in each case approximately $14.2 million per year, reflecting the similarities among these alternatives. As discussed in greater detail in Chapter 3, the provisions of Alternatives 3 and 4 are identical to those of Alternative 2, except that Alternative 3 (Preferred) would impose seasonal rather than year-round requirements on vessels fishing in the Mid- or South Atlantic, while Alternative 4 would impose seasonal rather than year-round requirements solely in the South Atlantic. The analysis suggests that a seasonal approach would have a relatively small effect on compliance costs because few vessels operating within these areas are active exclusively when ALWTRP requirements would not apply. Since they would be subject to ALWTRP regulations at some point during the year, the analysis assumes that these vessels would incur the cost of complying with ALWTRP requirements.[37]

The cost figure for Alternative 6 (Preferred) is approximately $65 thousand lower than the average cost of Alternatives 2 through 4. This difference is primarily due to two factors:

- Alternative 6 (Preferred) would allow vessels fishing in SAM waters to use two buoy lines per trawl or string rather than just one, and to employ floating line rather than sinking and/or neutrally buoyant line on the lower third of each buoy line.[38] This change in existing SAM regulations, which would take effect within six months of the promulgation of new regulations, is expected to have a beneficial effect on gear loss. In contrast, Alternatives 2 through 4 would leave existing SAM requirements for lobster trap/pot and gillnet vessels unchanged and would require other trap/pot vessels to comply with these requirements until 2008, when the SAM program would be eliminated. As a result, these alternatives would not have a beneficial effect on the loss of lobster and other trap/pot gear in SAM waters for several years.

[37] It is important to note that vessels that are ordinarily active when ALWTRP requirements would be in effect could avoid these requirements – and the associated costs – by ceasing operations during the period the rules would apply. This approach, however, would likely impose other adverse economic impacts on the affected vessels, such as a reduction in catch and associated revenues. In addition, more detailed assessment of trip reports for the Mid- and South Atlantic indicates that peaks in vessel activity occur when seasonal ALWTRP requirements would be in effect; relatively few vessels report taking more than half their trips when ALWTRP requirements would not apply. In light of these factors, the analysis assumes that vessels would continue to operate on a normal seasonal schedule, and that vessels that are ordinarily active when ALWTRP requirements are in effect would incur the associated compliance costs.

[38] Under all alternatives, lobster trap/pot vessels fishing in SAM waters that overlap with Northern Nearshore waters and Stellwagen Bank/Jeffrey's Ledge would still be limited to one buoy line for trawls of four or fewer trap/pots.

- Like Alternative 5, Alternative 6 (Preferred) would not make other trap/pot vessels subject to the requirements of the Dynamic Area Management program; this is in contrast to Alternatives 2 through 4, which would subject other trap/pot vessels to DAM requirements until 2008, when the DAM program would be eliminated.

6.2.2 Distribution of Compliance Costs by Fishery

Exhibits 6-12 through 6-14 provide additional information on the distribution of ALWTRP compliance costs by fishery. As Exhibit 6-12 indicates, the distribution of costs within the lobster trap/pot fishery is similar for Alternatives 2, 3 (Preferred), 4, and 6 (Preferred). Under these alternatives, vessels operating in Northern Inshore waters would account for 71 percent of the lobster trap/pot fishery's share of compliance costs; vessels operating in Offshore waters would account for 13 percent of the total, those operating in Northern Nearshore waters would account for 13 percent, and those operating in Southern Nearshore waters would account for 2 percent. The distribution of costs under Alternative 5 would differ. In this case, vessels operating in Northern Inshore waters would account for 73 percent of the lobster trap/pot fishery's share of compliance costs; vessels operating in Offshore waters would account for 4 percent, those operating in Northern Nearshore waters would account for 20 percent, and those operating in Southern Nearshore waters would account for 3 percent.

Exhibit 6-12

ESTIMATED INCREASE IN ANNUALIZED ALWTRP COMPLIANCE COSTS: LOBSTER TRAP/POT FISHERY (2003 dollars)

	Area				
Regulatory Alternative	**Northern Inshore Waters**	**Northern Nearshore Waters**	**Offshore Waters**	**Southern Nearshore Waters**	**Total**
Alternative 1 (No Action)	$0	$0	$0	$0	$0
Alternative 2	$9,130,000	$1,674,800	$1,730,600	$308,700	$12,844,000
Alternative 3 (Preferred)	$9,130,400	$1,675,300	$1,721,100	$303,800	$12,830,500
Alternative 4	$9,130,000	$1,674,800	$1,730,600	$308,700	$12,844,000
Alternative 5	$566,900	$157,000	$27,900	$22,000	$773,800
Alternative 6 (Preferred)	$9,128,000	$1,685,900	$1,709,000	$303,800	$12,826,700
Note: Totals may not sum due to rounding.					

Exhibit 6-13 suggests a significantly different distribution of compliance costs for vessels in other trap/pot fisheries. Under Alternatives 2, 3 (Preferred), and 4, vessels operating in Southern Nearshore waters would account for 52 percent of this group's compliance costs, those in Northern Inshore waters would account for 29 percent, those in Offshore waters would account for 14 percent, and those in Northern Nearshore waters would account for 5 percent. In contrast, under Alternative 5, Southern Nearshore vessels would account for only 39 percent of the compliance costs incurred by other trap/pot vessels, compared to 46 percent for vessels operating in Northern Inshore waters; Offshore vessels would account for 11 percent of the total, and Northern Nearshore vessels the remaining 4 percent. Under Alternative 6 (Preferred), the

distribution of costs would be closer to that estimated in the case of Alternatives 2 through 4; vessels operating in Southern Nearshore waters would account for 56 percent of compliance costs, those in Northern Inshore waters would account for 26 percent, those in Offshore waters would account for 14 percent, and those in Northern Nearshore waters would account for 4 percent.

Exhibit 6-13

ESTIMATED INCREASE IN ANNUALIZED ALWTRP COMPLIANCE COSTS: OTHER TRAP/POT FISHERIES (2003 dollars)

	Area				
Regulatory Alternative	**Northern Inshore Waters**	**Northern Nearshore Waters**	**Offshore Waters**	**Southern Nearshore Waters**	**Total**
Alternative 1 (No Action)	$0	$0	$0	$0	$0
Alternative 2	$128,000	$22,000	$62,000	$228,900	$440,900
Alternative 3 (Preferred)	$127,900	$22,000	$61,800	$226,400	$438,100
Alternative 4	$128,000	$22,000	$62,000	$228,900	$440,900
Alternative 5	$34,900	$3,100	$8,400	$30,200	$76,500
Alternative 6 (Preferred)	$101,300	$17,300	$55,000	$220,500	$394,000
Note: Totals may not sum due to rounding.					

Exhibit 6-14 summarizes the distribution of compliance costs for gillnet vessels. Again, the distribution of costs among Alternatives 2, 3 (Preferred), 4, and 6 (Preferred) is similar. Under these alternatives, Mid-Atlantic anchored gillnet vessels would account for 61 to 62 percent of the compliance costs incurred by the gillnet fleet, compared to 38 to 39 percent for Northeast anchored gillnet vessels and less than 1 percent for Mid-Atlantic driftnet or Southeast gillnet vessels. Under Alternative 5, the distribution of compliance costs is even more skewed. In this case, Mid-Atlantic anchored gillnet vessels would account for 88 percent of the costs that gillnet vessels would incur, compared to 12 percent for Northeast anchored gillnet vessels and less than 1 percent for Mid-Atlantic driftnet or Southeast gillnet vessels.

Exhibit 6-14

ESTIMATED INCREASE IN ANNUALIZED ALWTRP COMPLIANCE COSTS: GILLNET FISHERY (2003 dollars)

Regulatory Alternative	Fishery				Total
	Mid-Atlantic Anchored Gillnet	Mid-Atlantic Driftnet	Northeast Anchored Gillnet	Southeast Gillnet	
Alternative 1 (No Action)	$0	$0	$0	$0	$0
Alternative 2	$589,200	$700	$364,900	$2,400	$957,300
Alternative 3 (Preferred)	$580,600	$700	$364,600	$700	$946,700
Alternative 4	$589,200	$700	$364,900	$700	$955,600
Alternative 5	$147,100	$700	$19,500	$700	$168,000
Alternative 6 (Preferred)	$580,600	$700	$365,300	$700	$947,300
Note: Totals may not sum due to rounding.					

6.2.3 Average Vessel Compliance Costs

Exhibits 6-15 to 6-17 present average annual compliance cost estimates for lobster trap/pot, other trap/pot, and gillnet vessels under each regulatory alternative. As the exhibits show, average compliance costs for a particular category of vessel vary relatively little across alternatives, with the exception of Alternative 5. Under this alternative, average annual compliance costs are generally much lower.

Across fisheries, average compliance costs are highest for lobster trap/pot vessels, with overall annual compliance costs averaging approximately $3,500 per vessel under Alternatives 2, 3 (Preferred), 4, and 6 (Preferred). In comparison, average annual compliance costs for other vessels under these alternatives are significantly lower, ranging from approximately $900 per year for gillnet vessels to between $900 and $1,100 per year for other trap/pot vessels. The greatest compliance costs presented are those for offshore lobster trap/pot vessels under Alternatives 2, 3 (Preferred), 4, and 6 (Preferred); in these cases, compliance costs are estimated to average more than $10,200 per year, reflecting the large quantity of gear (e.g., groundline) that offshore lobster trap/pot vessels would be required to replace. At the opposite end of the range, average compliance costs for Mid-Atlantic driftnet vessels are minimal; these costs are not expected to exceed $9 per year under any of the alternatives considered.

Under Alternative 5, most vessels would face significantly lower compliance costs. Average annual costs by fishery range from approximately $164 per year for gillnet vessels to $184 per year for other trap/pot vessels and $210 per year for lobster trap/pot vessels. Other trap/pot vessels fishing in offshore waters would experience the highest cost increase under this alternative, facing average annual compliance costs of approximately $405 per year.

Exhibit 6-15

ESTIMATED INCREASE IN AVERAGE ANNUALIZED ALWTRP COMPLIANCE COSTS FOR AFFECTED LOBSTER TRAP/POT VESSELS (2003 dollars)

Regulatory Alternative	Area				Overall Average
	Northern Inshore Waters	Northern Nearshore Waters	Offshore Waters	Southern Nearshore Waters	
Alternative 1 (No Action)	$0	$0	$0	$0	$0
Alternative 2	$3,316	$2,564	$10,291	$2,774	$3,484
Alternative 3 (Preferred)	$3,316	$2,564	$10,286	$2,768	$3,483
Alternative 4	$3,316	$2,564	$10,291	$2,774	$3,484
Alternative 5	$206	$240	$167	$201	$210
Alternative 6 (Preferred)	$3,316	$2,574	$10,243	$2,768	$3,482
Note: Totals may not sum due to rounding.					

Exhibit 6-16

ESTIMATED INCREASE IN AVERAGE ANNUALIZED ALWTRP COMPLIANCE COSTS FOR AFFECTED OTHER TRAP/POT VESSELS (2003 dollars)

Regulatory Alternative	Area				Overall Average
	Northern Inshore Waters	Northern Nearshore Waters	Offshore Waters	Southern Nearshore Waters	
Alternative 1 (No Action)	$0	$0	$0	$0	$0
Alternative 2	$555	$1,105	$2,937	$1,563	$1,055
Alternative 3 (Preferred)	$555	$1,105	$3,037	$1,586	$1,060
Alternative 4	$555	$1,105	$2,937	$1,563	$1,055
Alternative 5	$151	$152	$405	$209	$184
Alternative 6 (Preferred)	$439	$861	$2,652	$1,526	$947
Note: Totals may not sum due to rounding.					

Exhibit 6-17

ESTIMATED INCREASE IN AVERAGE ANNUALIZED ALWTRP COMPLIANCE COSTS FOR AFFECTED GILLNET VESSELS (2003 dollars)

Regulatory Alternative	Fishery				Overall Average
	Mid-Atlantic Anchored Gillnet	Mid-Atlantic Driftnet	Northeast Anchored Gillnet	Southeast Gillnet	
Alternative 1 (No Action)	$0	$0	$0	$0	$0
Alternative 2	$957	$9	$1,086	$185	$917
Alternative 3 (Preferred)	$956	$9	$1,086	$185	$925
Alternative 4	$957	$9	$1,086	$185	$923
Alternative 5	$242	$9	$58	$185	$164
Alternative 6 (Preferred)	$956	$9	$1,088	$185	$925
Note: Totals may not sum due to rounding.					

6.2.4 Affected Vessels

Exhibits 6-18 to 6-20 present, by fishery, estimates of the number of vessels that each of the regulatory alternatives would affect. The exhibits show little variation across Alternatives 2 through 6. The lack of variation reflects the fact that each of the alternatives would impose new regulatory requirements on virtually all lobster trap/pot, other trap/pot, and gillnet vessels operating in waters governed by the ALWTRP.

Although the distribution of affected vessels varies little across alternatives, estimates of the number of vessels subject to potential modifications to the ALWTRP are indicative of the distribution of affected stakeholders within the commercial fishing industry. As Exhibit 6-18 shows, modifications to the ALWTRP would be likely to affect an estimated 3,700 lobster trap/pot vessels, including nearly 2,800 within the Northern Inshore lobster fishery. Changes to ALWTRP regulations would also be likely to affect approximately 650 lobster trap/pot vessels operating in the Northern Nearshore fishery, more than 160 in the Offshore fishery, and approximately 110 in the Southern Nearshore fishery.

Exhibit 6-18

ESTIMATED NUMBER OF LOBSTER TRAP/POT VESSELS AFFECTED BY CHANGES IN ALWTRP REQUIREMENTS UNDER EACH REGULATORY ALTERNATIVE

	Area				
Regulatory Alternative	**Northern Inshore Waters**	**Northern Nearshore Waters**	**Offshore Waters**	**Southern Nearshore Waters**	**Total**
Alternative 1 (No Action)	0	0	0	0	0
Alternative 2	2,753	653	168	111	3,686
Alternative 3 (Preferred)	2,753	653	167	110	3,684
Alternative 4	2,753	653	168	111	3,686
Alternative 5	2,753	655	167	110	3,684
Alternative 6 (Preferred)	2,753	655	167	110	3,684
Note: Totals may not sum due to rounding.					

The number of other trap/pot operations that would be affected by potential revisions to the ALWTRP is slightly more than one-tenth the number of lobster trap/pot vessels that would be affected.[39] As Exhibit 6-19 indicates, modifications to the ALWTRP would be likely to affect more than 400 other trap/pot operations, including approximately 230 active in Northern Inshore waters, 140 active in Southern Nearshore waters, 20 active in Northern Nearshore waters, and 20 active in Offshore waters.

[39] As Exhibit 6-19 notes, some vessels participate in more than one other trap/pot fishery, employing different sets of gear in each case. These vessels would be required to modify the gear they employ in each fishery to comply with ALWTRP requirements. To ensure that the cost analysis appropriately accounts for the costs of converting different sets of gear, the analysis of the other trap/pot fishery focuses on the number of affected "operations" (e.g., a black sea bass operation, a conch/whelk operation) rather than the number of affected vessels. Each set of gear that is subject to ALWTRP requirements is treated independently in the count of affected other trap/pot operations.

Exhibit 6-20 indicates that potential modifications to the ALWTRP would affect more than 1,000 gillnet vessels, including more than 600 anchored gillnet vessels that are active in Mid-Atlantic waters and approximately 340 that are active in Northeast waters. Modifications to the ALWTRP would also be likely to affect nearly 80 Mid-Atlantic driftnet vessels. The impact of new regulations would be significantly lower in the Southeast, where fewer than 20 gillnet vessels are likely to be affected.

Exhibit 6-19

ESTIMATED NUMBER OF OTHER TRAP/POT OPERATIONS AFFECTED BY CHANGES IN ALWTRP REQUIREMENTS UNDER EACH REGULATORY ALTERNATIVE[1]

	Area				
Regulatory Alternative	**Northern Inshore Waters**	**Northern Nearshore Waters**	**Offshore Waters**	**Southern Nearshore Waters**	**Total[2]**
Alternative 1 (No Action)	0	0	0	0	0
Alternative 2	231	20	21	146	418
Alternative 3 (Preferred)	231	20	21	144	416
Alternative 4	231	20	21	146	418
Alternative 5	231	20	21	144	416
Alternative 6 (Preferred)	231	20	21	144	416

[1] Some vessels participate in more than one other trap/pot fishery and would be required to modify the gear they employ in each case in order to comply with ALWTRP requirements. Each set of gear that is subject to ALWTRP requirements is treated independently in the count of affected other trap/pot operations.

[2] Totals may not sum due to rounding.

Exhibit 6-20

ESTIMATED NUMBER OF GILLNET VESSELS AFFECTED BY CHANGES IN ALWTRP REQUIREMENTS UNDER EACH REGULATORY ALTERNATIVE

	Fishery				
Regulatory Alternative	**Mid-Atlantic Anchored Gillnet**	**Mid-Atlantic Driftnet**	**Northeast Anchored Gillnet**	**Southeast Gillnet**	**Total**
Alternative 1 (No Action)	0	0	0	0	0
Alternative 2	616	79	336	13	1,044
Alternative 3 (Preferred)	607	77	336	4	1,024
Alternative 4	616	79	336	4	1,035
Alternative 5	607	77	336	4	1,024
Alternative 6 (Preferred)	607	77	336	4	1,024

Note: Totals may not sum due to rounding.

6.3 REFERENCES

Bisack, K.D., Estimates of the Number of Vessels and Quantity of Gear Deployed in the Lobster and Gillnet Fisheries in 1999 off the Northeast Coast of the United States, Northeast Fisheries Science Center Reference Document 03-15, September 2003.

Kenney, J., Loads on Buoy Systems, NMFS Gear Research Team, Unpublished report, October 2003.

NMFS, Final Rule: Taking of Marine Mammals Incidental to Commercial Fishing Operations; Atlantic Large Whale Take Reduction Plan Regulations, *Federal Register* (67)7: 1300-1314, January 10, 2002.

NMFS, Final Amendment 1 to Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks, Highly Migratory Species Management Division, page 11-5, November 2003.

Office of Management and Budget, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs, Circular Number A-94, Transmittal Memorandum Number 64, October 29, 1992.

U.S. Bureau of Labor Statistics, 2001 National Occupational Employment and Wage Estimates for Farming, Fishing, and Forestry Occupations, viewed online at: http://www.bls.gov/oes/2001/oes_45Fa.htm, September 5, 2003.

Appendix 6A

GEAR CONFIGURATIONS FOR MODEL VESSELS

This appendix provides detailed information on the quantity and configuration of gear that the analysis assumes each model vessel employs. The analysis uses this information to identify the gear modifications that vessels would need to make in order to comply with potential revisions to the ALWTRP.

Gear Characteristics For Trap/Pot Fisheries

For each model vessel in the lobster or other trap/pot fishery, NMFS gear specialists provided estimates of the quantity and configuration of gear fished, drawing upon their own experience and conversations with fishermen and state agencies.[1] In cases where the gear specialists provided a range of values, the analysis applies the mid-point of the range. Exhibits 6A-1 and 6A-2 provide data on gear characteristics for each model vessel employed in the analysis of the lobster and other trap/pot fisheries.

Gear Characteristics For Gillnet Fishery

For the gillnet fishery, gear configuration assumptions are based on data collected through the Northeast Domestic Fisheries Observer Program (NEOP).[2] The NMFS Northeast Fisheries Science Center (NEFSC) started the NEOP in 1989 to collect, maintain, and distribute data for scientific and management purposes. Since that time, the program has engaged an average of 35 scientific observers per year who have collectively logged an annual average of 2,300 days at sea. In 2003, observers were present on 1,600 fishing trips and spent the equivalent of ten years at sea.[3] Fisheries are prioritized for sampling based on national priorities (e.g., endangered or protected species); Fishery Management Council priorities; and scientific priorities for fishery stock assessments. In recent years, most sea days have been allocated to fixed-gear fisheries in order to monitor takes of protected species. Commonly sampled fisheries include the groundfish gillnet fishery in the Gulf of Maine and Mid-Atlantic, the swordfish long-line fishery, the pelagic drift-net fishery, and the pelagic pair trawl fishery. Over ten percent of

[1] An additional data source was used to develop the gear configuration assumptions for other trap/pot fisheries. The Massachusetts Division of Marine Fisheries (DMF) presented the results of a Gear Characteristics Survey at the May 2002 Advisory Gear Workshop, Narragansett, Rhode Island. DMF biologists and sea samplers interviewed 36 Massachusetts fishermen in the lobster (25), hagfish (8), and black sea bass (3) fisheries. The results of this survey for hagfish and black sea bass were reviewed by NMFS Gear Specialists and incorporated into the configuration estimates reported here.

[2] Where data from the Observer program were not available, NMFS gear specialists were consulted.

[3] Northeast Fisheries Science Center, Fishery Observer Program, viewed on September 10, 2003, available at: http://www.nefsc.noaa.gov/sos/fishobs/fishobs.html.

vessels in these target fisheries are sampled each year.[4] NEFSC carefully selects which trips are sampled to ensure that their performance is typical of fleets operating in the particular season and area.

For this analysis, NEOP data were analyzed for trips taken from January 2001 up to and including June 2003.[5] Exhibit 6A-3 presents summary statistics from the NEOP data used in this analysis, while Exhibit 6A-4 provides data on the quantity and configuration of gear that the analysis assumes each model vessel employs. Where NEOP data are available for a given variable, the mean value is used.[6] Where NEOP data are not available, the analysis bases the data on the professional judgement of NMFS gear specialists. In cases where the gear specialists provided a range of values, the analysis applies the mid-point of the range.

[4] Northeast Fisheries Science Center, Fishery Observer Program, viewed on November 20, 2003, available at: http://www.nefsc.noaa.gov/sos/fishobs/fishobs.html.

[5] NEFSC avoids placing observers on vessels that it deems to be unsafe either because of the size or condition of the vessel or because of the length of the trip. Consequently, certain types of vessels and trips are not observed uniformly. Likewise, trips in fisheries that may have a greater impact on protected species are observed more frequently than other trips. Consequently, these data may disproportionately represent trips that are shorter, occur in priority fisheries, and use vessels that are either larger or in better condition.

[6] For mid-Atlantic anchored gillnets, the median rather than the mean value is used to estimate net panel length. Although reported values range from 162 feet to 1,080 feet, with a mean value of 372 feet, 75 of the 134 sampled vessels (56 percent) use panels of 300 feet. Only 45 vessels (34 percent) use panels greater than 300 feet. In this case, use of the median value provides a better characterization of typical vessel operations.

Exhibit 6A-1

CONFIGURATION OF MODEL VESSELS: LOBSTER TRAP/POT FISHERY [1]

Region	Model Vessel Category	Traps/ Pots Per Vessel	Traps /Pots Per Trawl	Trawls Per Vessel[2]	Fishing Line Diameter	Groundline Between Traps (FA)	Fishing Depth (FA)	Buoy Lines Per Trawl	Weak Link	Buoys Per Trawl	Toggles Per Trawl
Northern Inshore	Cape Cod Bay: January 1 - May 15 / Pairs	600	2	300	3/8"	15	27.5	1	Mix	1	0.5
Northern Inshore	Cape Cod Bay: January 1 - May 15 / Trawls	600	20	30	3/8"	20	27.5	2	Mix	2	0.5
Northern Inshore	Cape Cod Bay: May 16 - December 31 / Pairs	600	2	300	3/8"	15	27.5	1	Mix	1	0.5
Northern Inshore	Cape Cod Bay: May 16 - December 31 / Trawls	600	20	30	3/8"	20	27.5	2	Mix	2	0.5
Northern Inshore	Current SAM: March 1 - July 31 / Pairs	600	2	300	3/8"	15	27.5	1	Mix	1	0.5
Northern Inshore	Current SAM: March 1 - July 31 / Trawls	600	20	30	3/8"	20	27.5	1	Mix	1	0.5
Northern Inshore	Northern Inshore Waters off the coast of Maine/ Pairs	600	2	300	3/8"	15	27.5	1	Mix	1	0.5
Northern Inshore	Northern Inshore Waters off the coast of Maine / Trawls	600	20	30	3/8"	20	27.5	2	Mix	2	0.5
Northern Inshore	Other Northern Inshore Waters / Pairs	600	2	300	3/8"	15	27.5	1	Mix	1	0.5
Northern Inshore	Other Northern Inshore Waters / Trawls	600	20	30	3/8"	20	27.5	2	Mix	2	0.5
Northern Inshore	Revised SAM: March 1 - July 31 / Pairs	600	2	300	3/8"	15	27.5	1	Mix	1	0.5
Northern Inshore	Revised SAM: March 1 - July 31 / Trawls	600	20	30	3/8"	20	27.5	2	Mix	2	0.5
Northern Inshore	Stellwagen Bank/Jeffrey's Ledge / Pairs	600	2	300	3/8"	15	27.5	1	Mix	1	0.5
Northern Inshore	Stellwagen Bank/Jeffrey's Ledge / Trawls	600	20	30	3/8"	20	27.5	2	Mix	2	0.5
Northern Inshore	Stellwagen Bank/Jeffrey's Ledge in Maine state waters / Pairs	600	2	300	3/8"	15	27.5	1	Mix	1	0.5

Exhibit 6A-1

CONFIGURATION OF MODEL VESSELS: LOBSTER TRAP/POT FISHERY [1]

Region	Model Vessel Category	Traps/ Pots Per Vessel	Traps /Pots Per Trawl	Trawls Per Vessel[2]	Fishing Line Diameter	Groundline Between Traps (FA)	Fishing Depth (FA)	Buoy Lines Per Trawl	Weak Link	Buoys Per Trawl	Toggles Per Trawl
Northern Inshore	Stellwagen Bank/Jeffrey's Ledge in Maine state waters / Trawls	600	20	30	3/8"	20	27.5	2	Mix	2	0.5
Northern Nearshore	Cape Cod Bay: January 1 - May 15	700	15	46.7	3/8"	17.5	55	2	Mix	2	1
Northern Nearshore	Cape Cod Bay: May 16 - December 31	700	15	46.7	3/8"	17.5	55	2	Mix	2	1
Northern Nearshore	Current SAM: March 1 - July 31	700	15	46.7	3/8"	17.5	55	1	Mix	1	1
Northern Nearshore	Other Northern Nearshore Waters	700	15	46.7	3/8"	17.5	55	2	Mix	2	1
Northern Nearshore	Revised SAM: March 1 - July 31	700	15	46.7	3/8"	17.5	55	2	Mix	2	1
Northern Nearshore	Stellwagen Bank/Jeffrey's Ledge	700	15	46.7	3/8"	17.5	55	2	Mix	2	1
Offshore	Current SAM: March 1 - July 31	1200	40	30	5/8"	20	135	1	Rope	1	0
Offshore	Great South Channel: July 1 - March 31	1200	40	30	5/8"	20	135	2	Rope	5	0
Offshore	Other Offshore Waters	1200	40	30	5/8"	20	135	2	Rope	5	0
Offshore	Revised SAM: March 1 - July 31	1200	40	30	5/8"	20	135	2	Rope	5	0
Southern Nearshore	LMA 6	1200	15	80	3/8"	17.5	35	2	--	2	0.5
Southern Nearshore	Other Southern Nearshore Waters	700	15	46.7	3/8"	17.5	55	2	Mix	2	1

Key:
Mix = NMFS gear specialists report that vessels in these areas make equal use of both hog rings and flat plastic weak links.
Rope = Offshore vessels typically use rope of an appropriate breaking strength to meet the weak link requirement.

Notes:
[1] In cases where NMFS gear specialists provided a range of values, the analysis applies the mid-point of the range.
[2] The number of trawls per vessel is calculated by dividing the number of traps/pots per vessel by the number of traps/pots per trawl.

Source: NMFS gear specialists.

Exhibit 6A-2

CONFIGURATION OF MODEL VESSELS: OTHER TRAP/POT FISHERY [1]

Region	Model Vessel Category	Traps/ Pots Per Vessel	Traps/ Pots Per Trawl	Trawls Per Vessel[2]	Fishing Line Diameter [3]	Groundline Between Traps (FA)	Fishing Depth (FA)	Buoy Lines Per Trawl	Buoys Per Trawl	Toggles Per Trawl
Northern Inshore	Cape Cod Bay Other State Waters / Black Sea Bass Trap/Pot	50	1	50	3/8"	--	40	1	1	0
Northern Inshore	Cape Cod Bay Other State Waters / Conch/Whelk Pot	150	1	150	3/8"	--	40	1	1	0
Northern Inshore	Cape Cod Bay Winter State Waters / Black Sea Bass Trap/Pot	50	2	25	3/8"	10	40	1	1	0
Northern Inshore	Cape Cod Bay Winter State Waters / Conch/Whelk Pot	150	2	75	3/8"	10	40	1	1	0
Northern Inshore	Northern State Waters / Black Sea Bass Trap/Pot	50	1	50	3/8"	--	40	1	1	0
Northern Inshore	Northern State Waters / Conch/Whelk Pot	150	1	150	3/8"	--	40	1	1	0
Northern Inshore	Northern State Waters / Scup Trap/Pot	50	1	50	3/8"	--	40	1	1	0.5
Northern Inshore	Northern State Waters / Shrimp Trap/Pot	100	1	100	3/8"	--	30	1	1	0
Northern Inshore	Stellwagen Bank State Waters / Black Sea Bass Trap/Pot	50	1	50	3/8"	--	40	1	1	0
Northern Inshore	Stellwagen Bank State Waters / Conch/Whelk Pot	150	1	150	3/8"	--	40	1	1	0
Northern Inshore	Stellwagen Bank State Waters / Hagfish Pot	500	20	25	5/8" and 3/4"	25	125	2	5	0
Northern Inshore	Stellwagen Bank State Waters / Scup Trap/Pot	50	1	50	3/8"	--	40	1	1	0.5
Northern Nearshore	Northern Nearshore / Black Sea Bass Trap/Pot	50	2	25	3/8"	10	40	1	1	0
Northern Nearshore	Northern Nearshore / Conch/Whelk Pot	150	2	75	3/8"	10	40	1	1	0
Northern Nearshore	Northern Nearshore / Hagfish Pot	500	20	25	5/8" and 3/4"	25	125	2	5	0
Northern Nearshore	Northern Nearshore / Scup Trap/Pot	50	2	25	3/8"	10	40	1	1	0.5

Exhibit 6A-2

CONFIGURATION OF MODEL VESSELS: OTHER TRAP/POT FISHERY [1]

Region	Model Vessel Category	Traps/ Pots Per Vessel	Traps/ Pots Per Trawl	Trawls Per Vessel[2]	Fishing Line Diameter [3]	Groundline Between Traps (FA)	Fishing Depth (FA)	Buoy Lines Per Trawl	Buoys Per Trawl	Toggles Per Trawl
Northern Nearshore	Northern Nearshore / Shrimp Trap/Pot	100	2	50	3/8"	10	30	1	1	0
Northern Nearshore	SAM West Nearshore / Hagfish Pot	500	20	25	5/8" and 3/4"	25	125	1	2.5	0
Northern Nearshore	Stellwagen Bank Nearshore / Black Sea Bass Trap/Pot	50	1	50	3/8"	--	40	1	1	0
Northern Nearshore	Stellwagen Bank Nearshore / Conch/Whelk Pot	150	1	150	3/8"	--	40	1	1	0
Northern Nearshore	Stellwagen Bank Nearshore / Hagfish Pot	500	20	25	5/8" and 3/4"	25	125	2	5	0
Northern Nearshore	Stellwagen Bank Nearshore / Scup Trap/Pot	50	1	50	3/8"	--	40	1	1	0.5
Northern Nearshore	Stellwagen Bank Nearshore / Shrimp Trap/Pot	100	1	100	3/8"	--	30	1	1	0
Offshore	Expanded SAM East Offshore / Black Sea Bass Trap/Pot	50	1	50	3/8"	--	40	1	1	0
Offshore	Expanded SAM East Offshore / Hagfish Pot	500	45	11.1	5/8" and 3/4"	40	125	2	5	0
Offshore	Great South Channel Closed / Hagfish Pot	500	45	11.1	5/8" and 3/4"	40	125	2	5	0
Offshore	Great South Channel Open / Black Sea Bass Trap/Pot	50	1	50	3/8"	--	40	1	1	0
Offshore	Great South Channel Open / Hagfish Pot	500	45	11.1	5/8" and 3/4"	40	125	2	5	0
Offshore	Offshore / Black Sea Bass Trap/Pot	50	1	50	3/8"	--	40	1	1	0
Offshore	Offshore / Conch/Whelk Pot	150	1	150	3/8"	--	40	1	1	0
Offshore	Offshore / Hagfish Pot	500	45	11.1	5/8" and 3/4"	40	125	2	5	0
Offshore	Offshore / Red Crab Trap/Pot	600	150	4	1"	62.5	240	2	5	0
Offshore	Offshore / Scup Trap/Pot	50	1	50	3/8"	--	40	1	1	0.5
Offshore	Offshore Above 40 Degrees North / Black Sea Bass Trap/Pot	50	1	50	3/8"	--	40	1	1	0

Exhibit 6A-2

CONFIGURATION OF MODEL VESSELS: OTHER TRAP/POT FISHERY [1]

Region	Model Vessel Category	Traps/ Pots Per Vessel	Traps/ Pots Per Trawl	Trawls Per Vessel[2]	Fishing Line Diameter [3]	Groundline Between Traps (FA)	Fishing Depth (FA)	Buoy Lines Per Trawl	Buoys Per Trawl	Toggles Per Trawl
Offshore	Offshore Above 40 Degrees North / Conch/Whelk Pot	150	1	150	3/8"	--	40	1	1	0
Offshore	Offshore Above 40 Degrees North / Hagfish Pot	500	45	11.1	5/8" and 3/4"	40	125	2	5	0
Offshore	Offshore Above 40 Degrees North / Red Crab Trap/Pot	600	150	4	1"	62.5	240	2	5	0
Offshore	Offshore Above 40 Degrees North / Scup Trap/Pot	50	1	50	3/8"	--	40	1	1	0.5
Offshore	Offshore Above 40 Degrees North Deeper than 280 Fathoms / Red Crab Trap/Pot	600	150	4	1"	62.5	340	2	5	0
Offshore	Offshore Deeper than 280 Fathoms / Red Crab Trap/Pot	600	150	4	1"	62.5	340	2	5	0
Offshore	SAM East Offshore / Black Sea Bass Trap/Pot	50	2	25	3/8"	10	40	1	1	0
Offshore	SAM East Offshore / Hagfish Pot	500	45	11.1	5/8" and 3/4"	40	125	1	2.5	0
Offshore	SAM West Offshore / Hagfish Pot	500	45	11.1	5/8" and 3/4"	40	125	1	2.5	0
Offshore	Southern Offshore South of Cape Hatteras, NC / Black Sea Bass Trap/Pot	50	1	50	3/8"	0	40	1	1	0
Southern Nearshore	LMA 6 / Black Sea Bass Trap/Pot	1100	20	55	3/8"	15	40	2	2	0
Southern Nearshore	LMA 6 / Conch/Whelk Pot	150	1	150	3/8"	--	40	1	1	0
Southern Nearshore	LMA 6 / Scup Trap/Pot	50	1	50	3/8"	--	40	1	1	0.5
Southern Nearshore	Southern Nearshore South of Cape Hatteras, NC / Black Sea Bass Pot	50	1	50	3/8"	0	40	1	1	0
Southern Nearshore	Southern Nearshore North of Cape Hatteras, NC and South of 40 Degrees North/ Black Sea Bass Trap/Pot	1100	20	55	3/8"	15	40	2	2	0

Exhibit 6A-2

CONFIGURATION OF MODEL VESSELS: OTHER TRAP/POT FISHERY [1]

Region	Model Vessel Category	Traps/ Pots Per Vessel	Traps/ Pots Per Trawl	Trawls Per Vessel[2]	Fishing Line Diameter [3]	Groundline Between Traps (FA)	Fishing Depth (FA)	Buoy Lines Per Trawl	Buoys Per Trawl	Toggles Per Trawl
Southern Nearshore	Southern Nearshore / Conch/Whelk Pot	150	1	150	3/8"	--	40	1	1	0
Southern Nearshore	Southern Nearshore / Scup Trap/Pot	50	1	50	3/8"	--	40	1	1	0.5
Southern Nearshore	Southern Nearshore Above 40 Degrees North / Black Sea Bass Trap/Pot	1100	20	55	3/8"	15	40	2	2	0
Southern Nearshore	Southern Nearshore Above 40 Degrees North / Conch/Whelk Pot	150	1	150	3/8"	--	40	1	1	0
Southern Nearshore	Southern Nearshore Above 40 Degrees North / Scup Trap/Pot	50	1	50	3/8"	--	40	1	1	0.5
Southern Nearshore	Southern Nearshore Deeper than 280 Fathoms / Red Crab Trap/Pot	600	150	4	1"	62.5	340	2	5	0

Key:
Mix = NMFS gear specialists report that vessels in these areas make equal use of both hog rings and flat plastic weak links.
Rope = Offshore vessels typically use rope of an appropriate breaking strength to meet the weak link requirement.

Notes:
[1] In cases where NMFS gear specialists provided a range of values, the analysis applies the mid-point of the range.
[2] The number of trawls per vessel is calculated by dividing the number of traps/pots per vessel by the number of traps/pots per trawl
[3] Hagfish vessels use both 5/8" and 3/8" diameter fishing line. For costing purposes, the analysis assumes that each diameter is used with equal frequency.

Source: NMFS gear specialists; Massachusetts Division of Marine Fisheries, Gear Characteristics Survey, Presented at the May 2002 Advisory Gear Workshop, Narragansett, Rhode Island, May 6-8, 2002.

Exhibit 6A-3

BACKGROUND INFORMATION ON GEAR CHARACTERISTICS FOR GILLNET VESSELS: NORTHEAST FISHERIES OBSERVER PROGRAM SUMMARY STATISTICS[1]

Fishery/Gear	Mean	Min	Max	Standard Deviation	Sample size (# vessels) [2]
Northeast Anchored Gillnet [3]					
Strings fished per vessel [4]	5.9	0	14	3	134
Net panels per string [5]	10.7	2	28	5	135
Depth to leadline (fathom)	33.7	5	95	17	134
Net panel length (feet)	300.0	282	350	5	135
Mid-Atlantic Anchored Gillnet [3]					
Strings fished per vessel [4]	5.8	1	20	3	137
Net panels per string [5]	7.2	1	25	7	139
Depth to leadline (fathom)	9.9	1	45	9	133
Net panel length (feet)	372.8	162	1,080	164	139
Mid-Atlantic Driftnet [3]					
Strings fished per vessel [4]	4.4	0	12	3	69
Depth to leadline (fathom)	9.3	1	46	8	73

Notes:

[1] For each variable listed, the mean value across all observer trips is calculated for each vessel. The summary statistics presented in this table are calculated for each geographic region from these mean per-vessel values. Minimum, maximum, and standard deviation values have been rounded to the nearest whole number.

[2] Data include trip information for 135 unique Northeast anchored gillnet vessels, 20 Northeast driftnet vessels, 139 Mid-Atlantic anchored gillnet vessels, and 73 Mid-Atlantic drift net vessels. Any variation in sample size is due to blank entries for specific variables.

[3] The definitions of drift gillnets and anchored gillnets differ slightly between the ALWTRP and the Northeast Domestic Fisheries Observer Program (NEOP). The ALWTRP defines an anchored gillnet as any gillnet gear, including a sink gillnet or stab net, that is set anywhere in the water column and which is anchored, secured or weighted to the bottom of the sea. In comparison, NEOP defines an anchored gillnet as a gillnet with an anchor on one or both ends of a string, with an anchor being defined as a weight sufficient to serve as anchor. According to the ALWTRP, a driftnet is a gillnet that is not attached to the ocean bottom and not anchored, secured, or weighted to the bottom, regardless of whether or not it is attached to a vessel. NEOP defines a driftnet as not having anchors or added weights that act as anchors. Gillnets that are weighted to the bottom by heavy leadlines would be considered anchored gillnets under the ALWTRP definition, but driftnets under the NEOP definition. The NEOP definition is used for the purposes of determining the gear configurations presented in this exhibit.

[4] Equal to the number of nets on board plus the number of nets soaking, divided by the number of nets per string.

[5] A net panel is assumed to be a wall of netting stretched between a weighted leadline on the bottom and a floatline, with or without floats, on the top to support it vertically in the water column. A net string is a series of net panels tied together with or without spaces between. These definitions are adapted from the Northeast Domestic Fisheries Observer Program *Gillnet Gear Characteristics Log*.

Source: Analysis of data from the Northeast Domestic Fisheries Observer Program, 2001 to 2003.

Exhibit 6A-4

CONFIGURATION OF MODEL VESSELS: GILLNET FISHERIES [1]

Region	Model Vessel Category	Strings Owned Per Vessel	Strings Fished Per Vessel	Ratio of Gear Owned to Fished	Net Panels Per String	Panel Length (feet)	Buoy Line Weak Links[2]	Net Panel Weak Links[2]	Flotation Devices Per String	Weighted Devices Per String	Buoy Lines Per String	Length of Ground-line Per String (FA)	Fishing Depth (FA)
Northeast	Cape Cod Bay Restricted Area / Anchored	17.6	5.9	3	10.7	300	1	1	4	0	2	180	33.7
Northeast	Expanded SAM / Anchored	17.6	5.9	3	10.7	300	1	1	4	0	2	180	33.7
Northeast	Great South Channel Restricted Gillnet Area / Anchored	17.6	5.9	3	10.7	300	1	1	4	0	2	180	33.7
Northeast	Great South Channel Restricted Gillnet Area and Expanded SAM / Anchored	17.6	5.9	3	10.7	300	1	1	4	0	2	180	33.7
Northeast	Great South Channel Sliver Restricted Area / Anchored	17.6	5.9	3	10.7	300	1	1	4	0	2	180	33.7
Northeast	Great South Channel Sliver Restricted Area and Expanded SAM / Anchored	17.6	5.9	3	10.7	300	1	1	4	0	2	180	33.7
Northeast	Other Northeast Gillnet Waters Area / Anchored	17.6	5.9	3	10.7	300	1	1	4	0	2	180	33.7
Northeast	SAM / Anchored	17.6	5.9	3	10.7	300	1	5	4	0	1	180	33.7
Northeast	Stellwagen Bank/Jeffreys Ledge Restricted Area & SAM / Anchored	17.6	5.9	3	10.7	300	1	5	4	0	1	180	33.7
Northeast	Stellwagen Bank/Jeffreys Ledge Restricted Area / Anchored	17.6	5.9	3	10.7	300	1	1	4	0	2	180	33.7
Northeast	Stellwagen Bank/Jeffreys Ledge Restricted Area and Expanded SAM / Anchored	17.6	5.9	3	10.7	300	1	1	4	0	2	180	33.7
Mid-Atlantic	Mid-Atlantic Coastal Waters Area / Driftnet	22.2	4.4	5	3.6	--	0	--	--	--	2	--	9.3
Mid-Atlantic	Mid-Atlantic Coastal Waters Area April 1 to November 30 / Anchored [3]	28.8	5.8	5	7.2	300	0	0	4	1	2	150	9.9

Exhibit 6A-4

CONFIGURATION OF MODEL VESSELS: GILLNET FISHERIES [1]

Region	Model Vessel Category	Strings Owned Per Vessel	Strings Fished Per Vessel	Ratio of Gear Owned to Fished	Net Panels Per String	Panel Length (feet)	Buoy Line Weak Links[2]	Net Panel Weak Links[2]	Flotation Devices Per String	Weighted Devices Per String	Buoy Lines Per String	Length of Ground-line Per String (FA)	Fishing Depth (FA)
Mid-Atlantic	Mid-Atlantic Coastal Waters Area December 1 to March 31 / Anchored [3]	28.8	5.8	5	7.2	300	0	0	4	1	2	150	9.9
Mid-Atlantic	New Mid-Atlantic / Anchored [3]	28.8	5.8	5	7.2	300	0	0	4	1	2	150	9.9
Mid-Atlantic	New Mid-Atlantic / Driftnet	22.2	4.4	5	3.6	--	0	--	--	--	2	--	9.3
South Atlantic	Northern Monitoring and Restricted Area west of 80 Degrees W / Anchored	10	2	5	1	2400	0	0	2	0	2	0	9.2
South Atlantic	Northern Monitoring and Restricted Area east of 80 Degrees W / Anchored	10	2	5	1	2400	0	0	2	0	2	0	9.2
South Atlantic	Southern Monitoring Area above 27°51' N / Anchored	10	2	5	1	2400	0	0	2	0	2	0	9.2
South Atlantic	Southern Monitoring Area below 27°51' N / Anchored	10	2	5	1	2400	0	0	2	0	2	0	9.2

Key:
"--" = Not applicable to this analysis

Notes:
[1] In cases where NMFS gear specialists provided a range of values, the analysis applies the mid-point of the range.
[2] Vessels in the northeast and mid-Atlantic currently use plastic weak links, rope of appropriate diameter, rope of appropriate breaking strength, or overhand knots as weak links in buoy line and net panels (plastic weak links are not used in net panels). For costing purposes, the analysis assumes all vessels use rope of appropriate breaking strength to meet current weak link requirements.
[3] The analysis assumes that 50 percent of anchored gillnet vessels in the mid-Atlantic employ two weighted devices per string, and 50 percent of vessels employ none.

Source: NMFS gear specialists; analysis of data from the Northeast Domestic Fisheries Observer Program, 2001 – 2003.

Appendix 6B

GEAR MODIFICATION REQUIREMENTS APPLICABLE TO THE LOBSTER, OTHER TRAP/POT, AND GILLNET FISHERIES

Under each regulatory alternative, gear modification requirements vary by fishery as well as the location and timing of fishing activity. Exhibits 6B-1 to 6B-4 illustrate the changes in gear requirements that each alternative specifies. In each exhibit:

- Solid circles identify new modifications that would be required by the corresponding regulatory alternative.

- Hollow circles identify cases in which a regulatory alternative would eliminate or relax existing ALWTRP measures. For example, under current ALWTRP regulations, lobster trap/pot vessels operating within SAM waters are allowed only one buoy line per trawl; however, the regulatory alternatives under consideration would allow these vessels to operate with two buoy lines on trawls with more than four traps or pots.[1]

- Shaded cells identify cases in which the ALWTRP had previously established gear modification requirements. Unless specifically modified or eliminated by the regulatory alternative under consideration, these requirements would continue to apply.

[1] The regulatory alternatives would still allow only one buoy line for vessels fishing trawls with four or fewer traps/pots in SAM waters that overlap Northern Nearshore waters.

Exhibit 6B-1

PROPOSED REGULATIONS BY GEAR PROVISION AND ALTERNATIVE: LOBSTER TRAP/POT FISHERY[1]

	Buoy Line Modification					Groundline Modification[2]					Weak Link Modification[3]					Set Restrictions					Gear Marking Modification[4]
Vessels Fishing In	**2**[5]	**3**[5]	**4**[5]	**5**[6]	**6**[7]	**2**	**3**	**4**	**5**	**6**	**2**	**3**	**4**	**5**	**6**	**2**[8]	**3**[8]	**4**[8]	**5**[9]	**6**[9]	**2 - 6**
Cape Cod Bay: January 1 - May 15											●	●	●	●	●						●
Cape Cod Bay: May 16 - December 31						●	●	●		●	●	●	●	●	●	○	○	○	○	○	●
Great South Channel: July 1 - March 31						●	●	●		●	●	●	●	●	●						●
LMA 6						●	●	●		●	●	●	●	●	●						●
Offshore North of 35°30'N						●	●[10]	●		●[10]	●	○[10]	●	○[10]	○[10]						●
Offshore South of 35°30'N						●	●[10]	●[11]		●[10]	●	●[10]	●[11]	●[10]	●[10]						●
Northern Inshore						●	●	●		●	●	●	●	●	●						●
Northern Nearshore						●	●	●		●	●	●	●	●	●	○	○	○	○	○	●
Current SAM: March 1 - July 31	○	○	○	○	○						●	●	●	●	●	○	○	○	○	○	●
Revised SAM: March 1 - July 31	■	■	■	●[12]	●[12]	■	■	■	●[12]	●[12]	■	■	■	●	●	■	■	■			●
Stellwagen Bank/Jeffrey's Ledge						●	●	●		●	●	●	●	●	●						●
Southern Nearshore North of 35°30'N						●	●[10]	●		●[10]	●	○[10]	●	○[10]	○[10]						●
Southern Nearshore South of 35°30'N						●	●[10]	●[11]		●[10]	●	●[10]	●[11]	●[10]	●[10]						●

Key:

- ▢ = Existing Baseline Requirements
- ● = Addition to Existing Requirements
- ○ = Relaxation of Existing Requirements
- ■ = Not Applicable

Notes: For specific details of various provisions, see Chapter 3, Regulatory Alternatives.

1 Table does not include universal gear modifications because they are not altered under the regulatory alternatives.

2 All groundline must be made entirely of sinking and/or neutrally buoyant line. This provision would become effective in the revised SAM zone (under Alternatives 5 and 6 only) within six months of the rule's publication, and by 2008 in all other cases. Vessels fishing in water deeper than 280 fathoms are exempt from this requirement.

3 Weak links must be placed on all flotation and weighted devices attached to the buoy line, such as surface buoys and toggles. In nearshore/inshore lobster waters, weak links with a breaking strength of 600 lb. would be required. In offshore lobster waters, including the Great South Channel between July 1 and March 31, the breaking strength on buoys would be reduced from 2000 lb. to 1500 lb. For vessel groups subject to weak link requirements under existing ALWTRP regulations, new weak links would only need to be installed on toggles or similar flotation and weighted devices.

4 Alternatives 2 through 6 remove current ALWTRP gear marking schemes and require all vessels to identify buoy lines with a four inch mark every ten fathoms, and to mark all surface buoys with either their vessel number or permit number.

5 Requirements that vessels fishing in SAM waters may only use one buoy line per trawl and buoy lines are made entirely of sinking and/or neutrally buoyant line are eliminated in 2008.

6 Requires the upper two-thirds of the buoy line to be made of sinking and/or neutrally buoyant line. For vessels fishing in SAM waters as currently defined, this provision relaxes existing requirements, allowing the bottom third of the buoy line to be made of floating line. For vessels fishing in areas that would be newly incorporated into the SAM zone, this provision represents a new requirement.

7 Requires the upper two-thirds of the buoy line to be made of sinking and/or neutrally buoyant line in SAM waters until 2008, when SAM provisions are eliminated.

8 Set restrictions in Northern Nearshore waters and in Federal waters of Cape Cod Bay, May 16 to December 31 would change from one buoy line for trawls with five traps/pots or fewer to one buoy line for trawls of four traps/pots or fewer. Restrictions in SAM waters limiting trawls to one buoy line would be eliminated in 2008.

9 For vessels fishing in SAM waters as currently defined, this provision changes existing set restrictions, allowing two buoy lines for all trawls. Set restrictions in Northern Nearshore waters and in Federal waters of Cape Cod Bay, May 16 to December 31 would change from one buoy line for trawls with five traps/pots or fewer to one buoy line for trawls of four traps/pots or fewer. The prohibition of single traps/pots in these two areas would not change from existing regulations.

10 Provision only applies September 1 to May 31 for vessels fishing between 40°00'N and the SC/GA border, November 15 to April 15 for vessels fishing between the SC/GA border and 29°00'N, and December 1 to March 31 for vessels fishing between 29°00'N and 27°51'N. Requirements apply year-round for all other vessels.

11 Provision only applies November 15 to April 15 for vessels fishing between the SC/GA border and 29°00'N, and December 1 to March 31 for vessels fishing between 29°00'N and 27°51'N. Requirements apply year-round for all other vessels.

12 This provision is unchanged to the extent that the revised SAM area is identical to the existing SAM area. Where the revised SAM area includes areas not regulated under the existing SAM, this provision represents an addition to existing requirements. Where the revised SAM area excludes areas that are regulated under the existing SAM, this provision represents a relaxation of existing requirements.

Exhibit 6B-2

PROPOSED REGULATIONS BY GEAR PROVISION AND ALTERNATIVE: OTHER TRAP/POT FISHERIES[1]

	Buoy Line Modification					Groundline Modification[2]					Weak Link Modification[3]					Set Restrictions					Dynamic Area Management[4]					Gear Marking Mod.[5]
Vessels Fishing In:	**2**[6]	**3**[6]	**4**[6]	**5**[7]	**6**[8]	**2**	**3**	**4**	**5**	**6**	**2**	**3**	**4**	**5**	**6**	**2**[9]	**3**[9]	**4**[9]	**5**[10]	**6**[10]	**2**	**3**	**4**	**5**	**6**	**2-6**
Cape Cod Bay: January 1 - May 15	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●
Cape Cod Bay: May 16 - December 31						●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●			●
Great South Channel: July 1 - March 31[11]						●	●	●		●	●	●	●	●	●						●	●	●			●
LMA 6						●	●	●		●	●	●	●	●	●						●	●	●			●
Offshore						●	●[12]	●[13]		●[12]	●	●[12]	●[13]	●[12]	●[12]						●	●	●			●
Northern Inshore						●	●	●		●	●	●	●	●	●						●	●	●			●
Northern Nearshore						●	●	●		●[12]	●	●[12]	●[13]	●[12]	●[12]	●	●	●	●	●	●	●	●			●
Current SAM: March 1 - July 31	●	●	●	■	■	●	●	●	■	■	●	●	●	■	■	●	●	●	■	■	●	●	●	■		●
Revised SAM: March 1 - July 31	■	■	■	●	●	■	■	■	●	●	■	■	■	●	●	■	■	■			●	●	●			●
Stellwagen Bank/Jeffrey's Ledge						●	●	●		●	●	●	●	●	●						●	●	●			●
Southern Nearshore						●	●[12]	●[13]		●[12]	●	●[12]	●[13]	●[12]	●[12]						●	●	●			●

Key:
● = New Requirements
■ = Not Applicable

Notes: For specific details of various provisions, see Chapter 3, Regulatory Alternatives.

1 Table does not include universal gear modifications because they are not altered under the regulatory alternatives.

2 All groundline must be made entirely of sinking and/or neutrally buoyant line. This provision would become effective in Cape Cod Bay (January 1 - May 15) and SAM waters within six months of the rule's publication, and by 2008 elsewhere. Vessels fishing in water deeper than 280 fathoms are exempt from this requirement.

3 Weak links must be placed on all flotation and weighted devices attached to the buoy line, such as surface buoys and toggles. Installing weak links at all surface buoys off the buoy line will place vessels fishing in Northern Inshore waters in compliance with the requirement to install at least one option from the Lobster Take Reduction Technology List under Alternative 5. The Lobster Take Reduction Technology List requirement would be eliminated for vessels under Alternatives 2, 3, 4, and 6.

4 All other trap/pot vessels may be temporarily restricted in areas north of 40°00'N latitude when aggregations of right whales are observed under the Dynamic Area Management (DAM) program until 2008, when the DAM program is eliminated. If a DAM zone is triggered, to continue fishing the following gear modifications may be required: all groundlines and the upper two-thirds of all buoy lines must be made of either sinking and/or neutrally buoyant line, and a weak link with a maximum breaking strength of 600 lb. (1500 lb. in offshore areas and the Great South Channel from July 1 to March 31) must be placed at all buoys.

5 All vessels are required to identify buoy lines with a four inch mark every ten fathoms, and to mark all surface buoys with either their vessel number or permit number.

6 Requires the upper two-thirds of the buoy line to be made of sinking and/or neutrally buoyant line in Cape Cod Bay, January 1 - May 15. Requires buoy line to be made entirely of sinking and/or neutrally buoyant line in SAM waters until 2008, when SAM provisions are eliminated.

7 Requires the upper two-thirds of the buoy line to be made of sinking and/or neutrally buoyant line.

8 Requires the upper two-thirds of the buoy line to be made of sinking and/or neutrally buoyant line in Cape Cod Bay, January 1 - May 15. Requires the upper two-thirds of the buoy line to be made of sinking and/or neutrally buoyant line in SAM waters until 2008, when SAM provisions are eliminated.

9 Set restrictions include (1) limiting sets in Cape Cod Bay from January 1 to May 15 to pairs or trawls of four or more traps/pots, (2) prohibiting single traps/pots and limiting sets to one buoy line for trawls with 4 or fewer traps/pots in Northern Nearshore waters and in Federal waters of Cape Cod Bay, May 16 to December 31, and (3) limiting sets to one buoy line per trawl in SAM restricted waters until 2008, when SAM provisions are eliminated.

10 Set restrictions include (1) limiting sets in Cape Cod Bay from January 1 to May 15 to pairs or trawls of four or more traps/pots and (2) prohibiting single traps/pots and limiting sets to one buoy line for trawls with 4 or fewer traps/pots in Northern Nearshore waters and in Federal waters of Cape Cod Bay, May 16 to December 31.

11 Great South Channel is closed to all trap/pot vessels from April 1 to June 30.

12 Provision only applies September 1 to May 31 for vessels fishing between 40°00'N and the SC/GA border, November 15 to April 15 for vessels fishing between the SC/GA border and 29°00'N, and December 1 to March 31 for vessels fishing between 29°00'N and 27°51'N. Requirements apply year-round for all other vessels.

13 Provision only applies November 15 to April 15 for vessels fishing between the SC/GA border and 29°00'N, and December 1 to March 31 for vessels fishing between 29°00'N and 27°51'N. Requirements apply year-round for all other vessels.

Exhibit 6B-3

PROPOSED GEAR MODIFICATIONS, BY PROVISION, GEAR TYPE, AND ALTERNATIVE: NORTHEAST AND MID-ATLANTIC GILLNETS[1]

Vessels Fishing In	Gear Marking Mod.[2]	Groundline Modification[3]					Flotation and Weighted Device Weak Link Mod.[4]					Net Panel Weak Link Modification[5]					Anchoring Requirement Modification[5]					Buoy Line Modifications				
	2-6	2	3	4	5	6	2	3	4	5	6	2	3	4	5	6	2	3	4	5	6	2[6]	3[6]	4[6]	5[7]	6[8]
Northeast Anchored Gillnets																										
Cape Cod Bay, Great South Channel Gillnet Area, and Great South Channel Sliver Area[9,10]	●	●	●	●		●	●	●	●	●	●	●	●	●		●	●	●	●		●					
Stellwagen Bank/Jeffrey's Ledge and Other Northeast Waters North[11]	●	●	●	●		●	●	●	●	●	●	●	●	●		●	●	●	●		●					
Other Northeast Waters South: Sep 1 – May 31[11]	●	●	●	●		●	●	●	●	●	●	●	●	●		●	●	●	●		●					
Other Northeast Waters South: Jun 1 – Aug 31[11]	●	●		●			●	○	●	●	○	●	○	●		○	●	○	●		○					
Current SAM: Mar 1 – Jul 31[12]	●	13	13	13	■	■	●	●	●	■	■				■	■				■	■	○	○	○	■	■
Revised SAM: Mar 1 – Jul 31[12]	●	■	■	■	●[14]	●[14]	■	■	■	●	●	■	■	■	●[14]	●[14]	■	■	■	●[14]	●[14]	■	■	■	●	●
Mid-Atlantic Anchored Gillnets																										
Areas 1 and 2: Sep 1 – May 31[15]	●	●	●	●			●	●	●	●	●	●	●	●		●										
Areas 1 and 2: Jun 1 – Aug 31	●	●		●			●		●			●		●			●		●							
Driftnets																										
Northeast (North)[16]	●											●	●	●		●										
Other Northeast Waters South: Sep 1 – May 31[11]	●											●	●	●		●										
Other Northeast Waters South: Jun 1 – Aug 31[11]	●											●		●												
Mid-Atlantic: Sep 1 – May 31	●											●	●	●		●										
Mid-Atlantic: Jun 1 – Aug 31	●											●		●												

Key:
■ = Existing Baseline Requirements
● = Addition to Existing Requirements
○ = Relaxation of Existing Requirements
■ = Not Applicable

Area 1 = West of 72°30'W and north of 33°51'N (NC/SC border).
Area 2 = South of VA/NC border, west of the Exclusive Economic Zone boundary, north of SC/GA border, and excluding Area 1 (defined above).
Notes: For specific details of various provisions, see Chapter 3, Regulatory Alternatives.

1 Table does not include universal gear modifications because they are not altered under the regulatory alternatives.

2 Alternatives 2 through 6 remove current ALWTRP gear marking schemes and require all vessels in the Northeast and Mid-Atlantic to mark surface buoys with vessel or permit number, and to identify buoy lines with a four inch mark every ten fathoms.

3 Groundlines must be made entirely of sinking and/or neutrally buoyant line by 2008. Vessels fishing in water deeper than 280 fathoms are exempt from this requirement.

4 Weak links required on all flotation and/or weighted devices attached to the buoy line, such as toggles or leaded lines. Existing requirements call for weak links only on buoy lines attached to the main buoy.

5 Anchored gillnets in the northeast must increase 1,100 pound weak links from one to five per net panel and secure anchored gillnets with the holding power of at least a 22-pound Danforth-style anchor at each end of the net string, consistent with existing SAM regulations. In the mid-Atlantic, anchored gillnets must either increase the number of 1,100 pound weak links per net panel from one to five and be secured at each end by a Danforth-style anchor or gear must be stored on board when the vessel returns to port. For driftnet vessels fishing with tended gear at night, one 1,100 pound weak link required per net panel.

6 The requirements that vessels fishing in SAM waters may only use one buoy line per string and that buoy lines are made entirely of sinking and/or neutrally buoyant line are eliminated in 2008.

7 Requires the upper two-thirds of the buoy line to be made of sinking and/or neutrally buoyant line. The bottom third of the buoy line may be floating line and vessels may use two buoy lines per string. This provision relaxes requirements for vessels fishing in SAM waters as currently defined, but represents a new requirement for vessels fishing in areas newly incorporated into the SAM zone.

8 Requires the upper two-thirds of the buoy line to be made of sinking and/or neutrally buoyant line in SAM waters until 2008, when SAM provisions are eliminated. The lower third of the buoy line may be floating line and vessels may use two buoy lines per string. This provision relaxes requirements for vessels fishing in SAM waters as currently defined, but represents a new requirement for vessels fishing in areas newly incorporated into the SAM zone.

9 Provisions apply in Cape Cod Bay from May 16 to December 31, in Great South Channel Gillnet Area from July 1 to March 31, and in Great South Channel Sliver Area year-round.

10 Under Alternative 5, Great South Channel Gillnet Area is closed from April 1 through June 30 (from July 1 to July 31, this area is included in the revised SAM area); critical habitat restrictions (as indicated) apply July 1 through March 31. Great South Channel Sliver Area critical habitat restrictions (as indicated) apply August 1 through April 30; SAM restrictions apply May 1 through July 31.

11 Other Northeast Waters Area is divided into north and south regions by a line beginning at 41°18.2'N latitude and 71°51.5'W longitude, south to 40°N, and east to the Exclusive Economic Zone boundary.

12 Restrictions in SAM are in addition to existing restrictions in overlapping sections of Stellwagen Bank/Jeffrey's Ledge and Other Northeast Waters. The Great South Channel Gillnet Area (excluding the Sliver Area) remains closed to gillnetting from April 1 through June 30.

13 Vessels fishing in SAM waters must already use sinking and/or neutrally buoyant groundline.

14 Where the revised SAM area includes areas not regulated under the existing SAM, the use of non-floating or neutrally buoyant groundline, five 1,100 pound weak links per net panel, and 22-pound Danforth style anchors represent additional requirements, and these provisions apply immediately. Where the revised SAM area excludes areas that are regulated under the existing SAM, these provisions relax some existing requirements.

15 Existing provisions (shaded) apply to Area 1 only from December 1 through March 31.

16 Includes all regulated areas north of a line beginning at 41°18.2'N latitude and 71°51.5'W longitude, south to 40°N, and east to the Exclusive Economic Zone boundary. Driftnet fishing is prohibited in Cape Cod Bay Restricted Area from January 1 to May 15 and in Great South Channel Restricted Gillnet Area (excluding the Sliver Area) from April 1 to June 30.

Exhibit 6B-4

PROPOSED GEAR MODIFICATIONS, BY PROVISION, GEAR TYPE, AND ALTERNATIVE: SOUTHEAST GILLNETS[1]

Vessels Fishing In	Universal Gear Modifications	Gear Marking Modification[2]	Non-Floating Line Modification[3]					Buoy Line Weak Link Modification[4]					Net Panel Weak Link Modification[5]					Anchoring Requirement Modification[5]				
	2 - 6	2 - 6	2	3	4	5	6	2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
Southeast Atlantic Gillnets																						
Area 1: Nov 15 – Apr 15	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Area 2: Nov 15 – Apr 15	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Areas 1 and 2: Apr 16 – Nov 14	●	●	●					●					●					●				
Area 3: Nov 15 – Nov 30	●	●	●					●					●					●				
Areas 3 and 4: Dec 1 – Mar 31	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Area 3: Apr 1 – Nov 14	●	●	●					●					●					●				
Area 4: Apr 1 – Nov 30	●	●	●					●					●					●				
Areas 5 and 6	●	●																				
Shark Gillnets																						
Northern Monitoring and Restricted Area and Southern Monitoring Area		○[6]																				

Key:
- ▢ = Existing Baseline Requirements
- ● = Addition to Existing Requirements
- ○ = Relaxation of Existing Requirements
- ■ = Not Applicable

Area 1 = South of 32°N, west of 80°W, and north of 29°N.
Area 2 = South of 32°N, east of 80°W, west of the Exclusive Economic Zone boundary, and north of 29°N.
Area 3 = South of 29°N, west of 80°W, and north of 27°51'N.
Area 4 = South of 29°N, east of 80°W, west of the Exclusive Economic Zone boundary, and north of 27°51'N.
Area 5 = South of 27°51'N, west of 80°W, and north of 26°46.5'N.
Area 6 = South of 27°51'N, east of 80°W, west of the Exclusive Economic Zone boundary, and north of 26°46.5'N.

Notes: For specific details of various provisions, see Chapter 3, Regulatory Alternatives.

1 Proposed alternatives specify replacement of observer coverage with a vessel monitoring system.

2 Alternatives 2 through 6 remove current ALWTRP gear marking schemes, with the exception of shark net panel gear marking (which remains the same), and require all vessels (including shark vessels) to mark surface buoys with vessel or permit number, and to identify buoy lines with a four inch mark every ten fathoms. In addition, shark gear must have one 4" blue mark and one 4" green mark once every 100 yards along both the float line and the leadline for each net panel. If shark vessel buoy lines are less than or equal to four feet in length, no buoy line marking is required.

3 Groundlines must be made entirely of sinking and/or neutrally buoyant line by 2008. Vessels fishing in water deeper than 280 fathoms are exempt from this requirement.

4 Weak links required on all flotation and/or weighted devices attached to the buoy line, such as toggles or leaded lines.

5 Requires gillnets to return to port with the vessel or be anchored with a 22-lb. Danforth anchor and have five 1,100 pound weak links per net panel under Alternatives 2, 3, 4, and 6. Only one 1,100 pound weak link per net panel is required under Alternative 5.

6 Gear marking requirements apply to the larger monitoring and restricted areas defined under Alternatives 2 through 6.

Appendix 6C

COST PARAMETERS FOR MATERIALS USED IN GEAR MODIFICATIONS

Introduction

This appendix provides a summary of the labor and material cost parameters the analysis uses to estimate compliance costs. Unit cost data were obtained from marine supply stores and NMFS gear specialists in the Northeast, Mid-Atlantic, and Southeast. The estimates represent an average of the range of reasonable costs, installation times, and useful life estimates for materials employed in gillnet and trap/pot fisheries along the Atlantic coast. The basis for these estimates is summarized below.

Fishing Line Costs

The unit cost of fishing line depends on its composition and diameter. For the lobster and other trap/pot fishery analyses, cost estimates are based on the most common type of line fishermen use. For the gillnet fishery analysis, cost estimates are based on the median price of the range of lines fishermen employ.

Useful Life of Fishing Line and Other Materials

Estimates of the useful life of fishing line and other materials were obtained from NMFS gear specialists. The useful life of fishing line and weak link devices is extremely uncertain due to variations in water temperature, bottom conditions, and the operating and maintenance practices of individual fishermen. NMFS gear specialists provided an anticipated range of useful lives for each type of line and device.[1] The analysis applies the midpoint of each range. For gear marking whips and rope-based weak links, however, the useful life of the modification is considered to be equal to the useful life of the fishing line into which it is spliced. For example, rope-based weak links spliced into gillnet panels will be replaced each time the net panel is replaced, which is typically every one to five years.

Summary

Exhibits 6C-1 and 6C-2 summarize these cost parameters for weak links, ground line, buoy line, and gear marking. To the extent that material costs, installation times, and estimates of expected useful life vary, the analysis may under- or over- estimate the costs of associated gear modifications.

[1] Neutrally buoyant and/or sinking line has not been used regularly by many fishermen; as a result, the useful life of this type of line is uncertain. It is generally believed, however, that the useful life of non-floating fishing line will be less than that of floating line, due to chafing caused by interaction with the ocean bottom.

Exhibit 6C-1

COST PARAMETERS: FISHING LINE

Description[1]	Purchase Price (per foot)	Installation Time (mins per 100 feet)	Average Useful Life (years)
Lobster and Other Trap/Pot Line			
3/8" floating line	$0.039	10	9
3/8" non-floating line	$0.058	10	6
5/8" floating line	$0.105	10	6
5/8" non-floating line	$0.183	10	5
3/4" floating line	$0.194	10	6
3/4" non-floating line	$0.246	10	5
1" floating line	$0.314	10	6
1" non-floating line	$0.453	10	5
Buoy line, nearshore/inshore waters [2]	NA	10	4
Buoy line, offshore waters [2]	NA	10	3
Gillnet Line			
1/2" floating line	$0.048	10	9
1/2" non-floating line	$0.085	10	5
Buoy line [2]	NA	NA	3

Notes:

[1] Floating line refers to either type of floating line (polypropylene or polyethylene). Non-floating line refers to sinking and/or neutrally buoyant fishing line.

[2] The cost of buoy line varies with its composition and diameter, consistent with the figures cited above. The useful life of buoy line, however, differs from the useful life of groundline.

Source: NMFS gear specialists; commercial marine supply dealers.

Exhibit 6C-2

COST PARAMETERS: WEAK LINKS AND OTHER MATERIALS

Description	Purchase Price	Installation Time (mins)	Average Useful Life (years)
Weak Links			
600 lb. plastic flat weak link	$1.09 per link [1]	10	2.5
7 hog rings with a breaking strength of 600 lb.	$0.07 per link [2]	5	3.5
Rope with a breaking strength of 1,500 lb. [3]	$0.08 per link	10	NA [4]
1,100 lb. rope-based weak link [5]	$0.05 per link	10 to 20 [6]	NA [4]
Other Equipment and Materials			
4" gear marking whip	$0.05 per whip	5	NA [4]
22-pound Danforth anchor	$70.00 per anchor	15	-- [7]

Notes:

[1] The purchase price of the 600 lb. plastic weak link reflects the average of the available 600 lb. plastic weak link options reported by commercial marine suppliers.

[2] The purchase price of the 7 hog rings reflects an average cost reported by commercial marine supply dealers.

[3] Rope diameter alone is not a clear indicator of breaking strength. However, NMFS gear specialists report that splicing two feet of floating rope 3/8" in diameter into the buoy line will achieve a breaking strength of 1500 lb.; as a result, the cost for this weak link type is equal to the cost of two feet of 3/8" floating line.

[4] The expected useful life of rope-based weak links and gear marking whips equals the expected useful life of the line on which they are installed.

[5] Rope diameter alone is not a clear indicator of breaking strength. However, NMFS gear specialists indicate that fishermen may use either a length of 1/4" diameter rope, which has a breaking strength of 1,100 pounds, or a length of 5/16" rope, which has an original breaking strength of 1,710 pounds and when tied in an overhand knot has a breaking strength of 1,100 pounds. This price represents two feet of 5/16" diameter polypropylene rope.

[6] The longer installation time represents installation of the links in existing net panels. The shorter installation time represents the installation of links as net panels are being constructed, or during installation in buoy lines.

[7] Rather than estimate a useful life, the analysis estimates that commercial fishermen replace 0 to 4 anchors each year due to damage or loss.

Source: NMFS gear specialists; commercial marine supply dealers.

Appendix 6D

ANALYTIC ASSUMPTIONS APPLIED IN THE ESTIMATION OF REGULATORY COMPLIANCE COSTS

This appendix identifies assumptions employed in the analysis of gear modification costs (see Exhibit 6D-1). These assumptions address current vessel characteristics, such as gear configuration changes that vessels made in response to past ALWTRP measures; anticipated changes in gear configuration that fishermen would make in response to changes in ALWTRP regulations; and general methodological issues, including assumptions concerning new regulatory requirements that are unlikely to impose significant costs.

Exhibit 6D-1

MAJOR ANALYTIC ASSUMPTIONS EMPLOYED IN THE GEAR MODIFICATION COST ANALYSIS

Assumption	Basis/Application	Affected Fisheries
Current Vessel Characteristics		
Lobstermen who complied with one option in the Lobster Take Reduction Technology List chose to attach weak links at all surface buoys.	Attaching weak links at all buoys is the least expensive of the three compliance options available on the Lobster Take Reduction Technology List.	Lobster Trap/Pot
Buoy line is assumed to be currently configured with non-floating line in the top one-third of the buoy line and floating line in the bottom two-thirds of the buoy line.	The most common buoy line configuration employs both sinking and floating line. Sinking line typically makes up the top third of the line, where the line ties into the surface buoy; the remainder is made of floating line. This dual configuration prevents the development of excess line at the surface or on the ocean floor, which can lead to gear loss either from passing vessel traffic at the surface, or from entanglement of buoy line on traps or marine debris on the ocean floor. NMFS gear specialists report that some vessels have already converted to all non-floating line in their buoy lines. To the extent that vessels that have already converted their buoy line to all non-floating line, this analysis will over-estimate buoy line modification costs.	Lobster Trap/Pot Other Trap/Pot
Gillnet vessels use 1/2" diameter groundline.	Gillnet vessels generally use groundline ranging from 3/8" to 5/8" diameter, depending on the species being targeted, the water currents, and the topography of the ocean bottom where the nets are set (for anchored gillnets only). As there are no data on the proportion of vessels using each type of line, an average diameter of 1/2" is assumed in this analysis.	Gillnet
Ten percent of driftnet vessels in the Northeast and Mid-Atlantic fish at night.	No data are available on the proportion of driftnet vessels that fish at night, although NMFS gear specialists believe that proportion to be very low.	Gillnet
Changes in Response to New Regulatory Requirements		
Under Alternatives 2 through 4, once SAM is eliminated in 2008, vessels would likely use a second buoy line on all trawls and net strings. As a result, these vessels would be required to install weak links on the additional buoy lines.	Under Alternatives 2 through 4, fishing in SAM restricted waters would be limited to one buoy line per trawl or net string. In 2008, the SAM program would be eliminated and vessels would no longer be subject to this restriction. The analysis assumes that vessels would take advantage of this change by using two buoy lines on all trawls and net strings. Lobster and other trap/pot vessels in Northern Nearshore waters that overlap with SAM and fish with trawls of four or fewer traps/pots would still be limited to one buoy line per trawl. The costs associated with this change are factored into the analysis.	All Fisheries
Other trap/pot fishermen who need to comply with one option in the Lobster Take Reduction Technology List will choose to attach weak links at all surface buoys.	Attaching weak links at all buoys is the least expensive of the three compliance options available on the Lobster Take Reduction Technology List.	Other Trap/Pot

Exhibit 6D-1

MAJOR ANALYTIC ASSUMPTIONS EMPLOYED IN THE GEAR MODIFICATION COST ANALYSIS

Assumption	Basis/Application	Affected Fisheries
Other trap/pot fishermen who operate within waters subject to DAM under Alternatives 2 through 4 will choose to implement all gear modifications that allow fishing activity to continue in cases where NMFS implements a mandatory gear modification requirement for a triggered DAM action.	The analysis assumes that NMFS would implement gear modification requirements and not mandatory gear removals for all triggered DAM actions. If a DAM action is triggered, fishermen operating within the applicable waters are faced with three options: (1) convert their gear in accordance with DAM gear modification requirements and continue fishing; (2) choose not to convert their gear, pull gear from the DAM zone, and stop fishing; or (3) choose not to convert their gear and move gear outside the DAM zone until the restriction is over. This analysis assumes that vessels operating within waters subject to DAM would choose the first option and convert all their gear so that they will be able to continue fishing if NMFS implements a mandatory gear modification DAM action.	Other Trap/Pot
One-third of all Northeast anchored gillnet vessels not fishing in the SAM zone already comply with the anchoring requirements of Alternatives 2 through 4. The remaining two-thirds will have to purchase compliant anchors.	Accurate estimates of the number and type of anchors used by anchored gillnet vessels are not available. Three anchoring options are currently available to these vessels, only one of which meets the requirements under Alternatives 2 through 4. The analysis assumes that an equal number of vessels currently use each of the three anchoring options; therefore, one-third of all vessels are currently using anchors that would be compliant under Alternatives 2 through 4.	Gillnet
One-half of all anchored gillnet vessels in the Mid-Atlantic and Southeast will choose to secure their nets with anchors under Alternatives 2 through 4; the other half will store their nets on board when returning to port.	Accurate estimates of the number and type of anchors used by anchored gillnet vessels are not available. Two options are available to these vessels: (1) secure the nets at each end with at least the holding power of a 22-pound Danforth-style anchor, or (2) haul nets and keep them on board when returning to port. The analysis assumes that an equal number of vessels would choose each option.	Gillnet
Methodological Assumptions		
The quantity of gear employed by each model vessel approximates the average quantity of gear that vessels in that category employ.	Each model vessel is designed to represent the typical configuration of gear employed by vessels in that category. Assumptions concerning the quantity of gear that vessels employ are representative of vessels that target a fishery on a regular basis. Because the number of affected vessels in each fishery includes some part-time or occasional fishermen with commercial permits, this assumption could produce an overestimate of typical vessel gear conversion costs.	All Fisheries
Compliance costs for other trap/pot vessels targeting species other than black sea bass, conch/whelk, hagfish, red crab, scup, and shrimp are assumed to equal the average compliance costs for vessels targeting black sea bass, conch/whelk, and scup.	Other trap/pot vessels that target black sea bass, conch/whelk, and scup were identified as having the greatest potential to catch non-targeted trap/pot species. Compliance costs for vessels that target these other species are assumed to equal the mean compliance costs for other trap/pot vessels that target black sea bass, conch/whelk, or scup.	Other Trap/Pot
For the gillnet fishery, the analysis assumes that the cost of complying with gear marking and anchoring requirements is a function of the number of strings fished rather than the number of strings owned.	Fishermen typically use the same buoy lines and anchors and swap nets in and out based on the target species.	Gillnet

Exhibit 6D-1

MAJOR ANALYTIC ASSUMPTIONS EMPLOYED IN THE GEAR MODIFICATION COST ANALYSIS

Assumption	Basis/Application	Affected Fisheries
Requirements that Would Not Impose a Significant Cost		
Newly regulated fisheries will not incur any additional costs to comply with universal gear modifications.	The two required provisions under the universal gear modifications are (1) no floating buoy line at the surface and (2) no wet storage of gear. Most fishermen already practice both these techniques to keep fishing gear in good condition and prevent gear loss.	All Fisheries
Newly regulated fisheries will not incur any additional costs to comply with the requirement to mark all surface buoys with their vessel number or permit number.	Most fishermen already mark their surface buoys with a vessel ID, and in some cases, this provision is already required by other regulations at both the Federal and state level.	All Fisheries
A requirement to use non-floating groundline would impose no additional costs on Southeast anchored gillnet vessels.	Anchored gillnet fishermen in the Southeast do not use groundline.	Gillnet
Changes to the ALWTRP would impose no additional costs on anchored float gillnet vessels in the Northeast.	There is no significant anchored float gillnet fishery in the northeast. The 133 vessels reported in the 2003 List of Fisheries are believed to be part of the shad fishery, which is no longer active.	Gillnet
Shark vessels will not typically incur costs as a result of the proposed requirement that all shark vessels mark buoy lines that are more than four feet long with a four inch mark every ten fathoms (or one mark in the center of buoy lines ten fathoms or less).	Typically, shark vessels do not use buoy lines, and the lines extending from the end of the net to the stern of the vessel (which are considered buoy lines for the purposes of the ALWTRP) are less than four feet in length. Therefore, the analysis assumes shark vessels will incur no costs as a result of this requirement. During rough seas, shark vessels may use lines up to 20 feet between the end of the net and the stern of the vessel. The analysis does not include costs of adding weak links to lines under such circumstances.	Gillnet
Driftnet vessels will not incur costs as a result of the proposed requirement that all groundline must be sinking and/or neutrally buoyant by 2008.	Generally, driftnets do not have any line that would be considered groundline. Some driftnet vessels will attach small (window-sash) weights to the buoy lines to increase the nets' drag in the water, which assists in unfurling and setting the nets. The line between the net and the sash weight would be considered groundline under the ALWTRP. However, no information on the proportion of driftnet vessels that use sash weights is available. In addition, line to these weights is typically short so that a vessel using sash weights would use a very small amount of groundline. Therefore, the analysis does not estimate costs of replacing groundline with sinking and/or neutrally buoyant line.	Gillnet

Sources: NMFS gear specialists.

Appendix 6E

DATA USED IN THE ANALYSIS OF GEAR LOSS COSTS

The cost of gear loss is calculated as the sum of the material and labor costs to replace lost traps/pots, groundline, buoy line, weak links, and gear markings. Unit material and labor costs for groundline, buoy line, weak links, and gear markings are presented in Appendix 6C. Exhibit 6E-1 provides similar information for the replacement of lost traps/pots, including the time required to incorporate a new trap into a trawl.

Exhibit 6E-1

MATERIAL COST AND INSTALLATION TIME OF LOBSTER AND OTHER TRAP/POT EQUIPMENT

Target Species	Trap/Pot Cost ($ per trap)	Installation Time (mins)
American Lobster, Inshore/Nearshore	$ 45[1]	10
American Lobster, Offshore	$ 92	10
Black Sea Bass	$ 45	10
Conch/Whelk	$ 35[2]	10
Hagfish	$ 60	10
Red Crab	$ 112.5[3]	10
Scup	$ 45	10
Shrimp	$ 50	10

Source: NMFS gear specialists; commercial marine supply dealers.

Notes:

1 The cost of Inshore/Nearshore lobster traps/pots ranges from $40 to $50. This analysis uses the median cost.

2 The cost of conch/whelk pots ranges from $20 to $50. This analysis uses the median cost.

3 The cost of red crab traps/pots ranges from $75 to $150. This analysis uses the median cost.

Appendix 6F

FISHING RESTRICTIONS AND CLOSURES APPLICABLE TO GILLNET VESSELS

For each of the regulatory alternatives, Exhibits 6F-1 and 6F-2 summarize changes to existing fishing restrictions and closures applicable to gillnet vessels. Fishing restrictions vary by geographic region and time period, and the majority of restrictions apply only to drift gillnets (as opposed to anchored gillnets). Costs are incurred only if the regulatory alternative would result in changes to existing fishing behavior (i.e., fishing behavior under Alternative 1).

Exhibit 6F-1

PROPOSED FISHING REQUIREMENTS AND CLOSURES, BY PROVISION AND ALTERNATIVE: NORTHEAST AND MID-ATLANTIC DRIFT GILLNETS

Vessels Fishing In	Closures[1]					Night Set Restriction[2]					Gear Stowing Requirement[3]				
	2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
Northeast															
Cape Cod Bay and Great South Channel Gillnet Area [4]	●	●	●	●	●										
Cape Cod Bay, Great South Channel Gillnet Area, Great South Channel Sliver, Stellwagen Bank/Jeffrey's Ledge, and Other Northeast Waters North [5,6]						●	●	●	●	●	●	●	●	●	●
Other Northeast Waters South: Sep 1 – May 31 [6]						●	●	●	●	●	●	●	●	●	●
Other Northeast Waters South: Jun 1 – Aug 31 [6]						●		●	●		●		●	●	
Mid-Atlantic															
Area 1: Sep 1 – Nov 30 and Apr 1 – May 31						●	●	●	●	●	●	●	●	●	●
Area 1: Dec 1 – Mar 31															
Areas 1 and 2: Jun 1 – Aug 31						●		●			●		●		
Area 2: Sep 1 – May 31						●	●	●	●	●	●	●	●	●	●

Key:

■ = Existing Baseline Requirements
● = Addition to Existing Requirements
○ = Change to Existing Requirements
■ = Not Applicable

Area 1 = West of 72°30'W and north of 33°51'N (NC/SC border).
Area 2 = South of VA/NC border, west of the Exclusive Economic Zone boundary, north of SC/GA border, and excluding Area 1 (defined above).

Notes: For specific details of various provisions, see Chapter 3, Regulatory Alternatives.

[1] Inclusion of Northeast driftnets under Alternatives 2 through 6 will result in closing the Cape Cod Bay driftnet fishery from January 1 through May 15 and closing the Great South Channel Gillnet Area driftnet fishery from April 1 through June 30.

[2] No fishing with driftnet gear at night unless gear is tended.

[3] Gear must be removed from the water and stowed on board the vessel before returning to port.

[4] Provisions apply to Cape Cod Bay from January 1 through May 15 and to Great South Channel Gillnet Area from April 1 through June 30.

[5] Provisions apply to Cape Cod Bay from May 16 through December 31 and to Great South Channel Gillnet Area from July 1 through March 31. In all other areas listed, the provisions apply year-round.

[6] The Other Northeast Waters Area is divided into north and south regions by a line beginning at 41°18.2'N latitude and 71°51.5'W longitude, south to 40°N, and east to the Exclusive Economic Zone boundary.

Exhibit 6F-2

PROPOSED FISHING REQUIREMENTS AND CLOSURES, BY PROVISION AND ALTERNATIVE: SOUTHEAST GILLNETS

	Closures[1,2]					Night Set Restrictions[1,3]					Spotter Plane Requirement[1,4]					Whale Approach Requirement[1,5]					Monitoring Requirement[6]				
Vessels Fishing In	**2**	**3**	**4**	**5**	**6**	**2**	**3**	**4**	**5**	**6**	**2**	**3**	**4**	**5**	**6**	**2**	**3**	**4**	**5**	**6**	**2**	**3**	**4**	**5**	**6**
Shark Gillnets																									
Area 1: Nov 15 – Mar 31																					○[1]	○[1]	○[1]	○[1]	○[1]
Area 1: Apr 1 – Apr 15	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Areas 1 and 2: Apr 16 – Nov 14																●									
Area 2: Nov 15 – Apr 15	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Area 3: Nov 15 – Nov 30	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		○	○	○	○	○[1]	○[1]	○[1]	○[1]	○[1]
Area 3: Dec 1 – Mar 31																					○	○	○	○	○
Area 3: Apr 1 – Nov 14																●									
Area 4: Dec 1 – Mar 31	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Area 4: Apr 1 – Nov 30																●									
Area 5: Nov 15 – Nov 30																					○[1]	○[1]	○[1]	○[1]	○[1]
Area 5: Dec 1 – Mar 31																					○	○	○	○	○
Area 6: Dec 1 – Mar 31																					●	●	●	●	●
Southeast Atlantic Gillnets																									
Area 1: Nov 15 – Mar 31; Area 3: Dec 1 – Mar 31																									
Area 2: Nov 15 – Apr 15; Area 1: Apr 1 - Apr 15; Area 4: Dec 1 - Mar 31						●	●	●	●	●															
Area 3: Nov 15 – Nov 30						○	○	○	○	○															

Key:

■ = Existing Baseline Requirements

● = Addition to Existing Requirements

○ = Change to Existing Requirements

■ = Not Applicable

Area 1 = South of 32°N, west of 80°W, and north of 29°N.

Area 2 = South of 32°N, east of 80°W, west of the Exclusive Economic Zone boundary, and north of 29°N.

Area 3 = South of 29°N, west of 80°W, and north of 27°51'N.

Area 4 = South of 29°N, east of 80°W, west of the Exclusive Economic Zone boundary, and north of 27°51'N.

Area 5 = South of 27°51'N, west of 80°W, and north of 26°46.5'N.

Area 6 = South of 27°51'N, east of 80°W, west of the Exclusive Economic Zone boundary, and north of 26°46.5'N.

Notes: For specific details of various provisions, see Chapter 3, Regulatory Alternatives.

[1] Changes in existing provisions are due to changes in restricted times and areas under Alternatives 2 through 6.

[2] Area closed to shark gillnet fishing, except for strikenetting.

[3] No straight sets of gillnet gear at night. Strikenet gear may not be set at night or when visibility is less than 500 yards.

[4] Restriction is applicable only to vessels strikenetting for sharks.

[5] If a right, humpback, or fin whale moves within three nautical miles of set gear, the gear must be removed immediately from the water and cannot be reset until the whale is no longer in the area.

[6] Under Alternative 1, vessel operator must call NMFS' SE Regional Office not less than 48 hours prior to departure to arrange for observer coverage. Under Alternatives 2 through 6 vessels must use a Vessel Monitoring System (VMS), as implemented in the Highly Migratory Species (HMS) Fishery Management Plan (FMP).

Appendix 6G

STATE DATA USED TO IDENTIFY VESSELS AFFECTED BY THE REGULATORY ALTERNATIVES

This appendix summarizes data on the number of vessels fishing in state waters that would be affected by the regulatory alternatives under consideration. Vessels that fish in state waters but hold Federal permits are excluded, since these vessels are accounted for in the analysis of Federal data. The appendix is organized into three sections (one for each fishery).

Lobster Trap/Pot Fishery

For the lobster trap/pot fishery, Exhibit 6G-1 provides data obtained from the trap tag program summarizing the number of fishermen that purchased trap tags for use within state waters. The exhibit identifies the total number of fishermen that purchased trap tags as well as those that purchased more than 100 tags. The analysis applies the latter figure to estimate the number of active lobster trap/pot vessels operating in state waters without a Federal permit.[1] Exhibit 6G-2 identifies the number of these vessels that are assumed to be subject to the regulatory alternatives under consideration, based on the percentage of state waters that the alternatives do not exempt.

Exhibit 6G-1

NUMBER OF COMMERCIAL FISHERMEN THAT PURCHASED TRAP TAGS TO PARTICIPATE IN 2003 STATE WATER LOBSTER TRAP/POT FISHERY

State	Number of Trap Tag Holders	Number of Fishermen that Purchased Greater Than 100 Trap Tags
Maine	4,183	3,719
New Hampshire	256	117
Massachusetts	649	529
Rhode Island	351	193
Connecticut	234	184
New York	210	159

[1] The analysis of compliance costs is based upon the costs that would be incurred by a full-time lobster trap/pot vessel. Fishermen who purchase fewer than 100 trap tags are unlikely to be engaged in lobstering on a full-time basis. Excluding these individuals from the analysis ensures that the estimate of affected lobster trap/pot vessels is not overstated.

Exhibit 6G-2

ESTIMATED NUMBER OF STATE-PERMITTED LOBSTER TRAP/POT VESSELS ACTIVELY FISHING WITHIN WATERS SUBJECT TO ALWTRP REQUIREMENTS

State[1]	Number of Fishermen that Purchased Greater Than 100 Trap Tags	Percentage of State Waters Subject to ALWTRP Requirements	Estimated Number of Vessels Affected by Regulations [2]
Maine	3,719	50.2 %	1866
New Hampshire	117	81.7 %	96
Massachusetts	529	84.1 %	445
Rhode Island	193	70.5 %	136
Connecticut	184	0 %	0
New York	159	31.4 %	50

Notes:
[1] Lobster rarely occur within territorial waters south of New York. All permitted lobstermen from New Jersey south hold Federal lobster permits and are included in the Federal analysis.
[2] All values are rounded to the nearest whole number.

Other Trap/Pot Fishery

Exhibit 6G-3 summarizes data on other trap/pot fisheries provided by representatives of state fisheries management agencies. As indicated in the exhibit, some state officials provided estimates of the number of permitted vessels, while others estimated the number of vessels that are actively operating within state waters. Exhibit 6G-4 summarizes the calculations applied to estimate the number of active other trap/pot vessels that are subject to ALWTRP requirements. As shown, the analysis applies the following scalars to the data provided by the states:

- **Percent Active**: Many states reported only the total number of vessels that are permitted to operate within state waters. The analysis scales these data by the percentage of permitted vessels (from all fisheries) that are assumed to be active, based upon data from states that report both permitted and active vessels.

- **Percent with Federal Permits**: To avoid double-counting vessels that have permits to fish in Federal waters, and are therefore captured in the Federal vessel data, the number of active vessels is also scaled by the percentage of vessels that do not hold Federal permits. Where these data are unavailable, the analysis assumes that no state vessels hold Federal permits.

- **Percent that Use Trap/Pot Gear**: The data provided by the New York and Rhode Island fisheries management agencies reflect vessels fishing with a variety of gear types. The analysis relies on gear information provided with NMFS 2002 landings data to estimate the number of trap/pot vessels in New York and Rhode Island.

- **Percent Outside Exempt Waters**: A portion of state waters are exempt from ALWTRP requirements; thus, vessels operating solely within those areas are unaffected by modifications to the ALWTRP. To account for this, the analysis assumes that vessel activity is evenly distributed within state waters and scales the number of vessels that hold only state permits by the percentage of state waters subject to ALWTRP requirements.

- **Number of Vessels that Operate with Multiple Gear Types**: Finally, within some state waters, vessels operate with multiple gear types that target different fish species. Because these vessels would be required to modify each gear set, the cost of compliance is greater for these vessels. To account for this, the analysis scales the number of vessels by the proportion of vessels that fish more than one type of gear. This proportion is calculated from VTR data that indicate the target species of each active federally-permitted vessel.

Exhibit 6G-3

DATA PROVIDED BY STATE FISHERIES MANAGEMENT AGENCIES: OTHER TRAP/POT FISHERIES

State	Number Provided by State Contact	Description of Commercial Fishing Data
Maine	416	Commercial Shrimping licenses issued in 2001-2002 season
	16	Estimated number of Commercial Shrimping license holders using trap gear in 2002-2003 season
New Hampshire	7	Commercial Saltwater permits issued in 2003 that specify "fish trap" as a gear code
Massachusetts	161	Conch permits issued in 2001
	169	Scup permits issued in 2001
	65	Black sea bass permits issued in 2001
	82	Conch permits reported active in 2001
	64	Scup permits reported active in 2001
	55	Black sea bass permits reported active in 2001
Rhode Island	998	Multi-Purpose permits issued in 2001 (gear not specified)
Connecticut	227	Commercial licenses authorizing the use of fish pots issued in 2002
	34	Commercial license holders that reported fishing with traps/pots in 2002.
	29	Conch pot licenses issued in 2002[1]
New York	1197	Foodfish licenses issued in 2002 (gear not specified)
New Jersey	254	General fish/lobster/conch pot licenses issued in 2002
Delaware	6	Active sea bass potters (year unspecified)
	53	Active conch potters (year unspecified)
	211	Active blue crab potters (year unspecified)[2]
Maryland	362	Commercial trap/pot permits issued to individuals residing in two ocean-fronting counties in 2002
	7	Conch potters active in Maryland's ocean waters in 2002
	6	Fish potters active in Maryland's ocean waters in 2002
Virginia	3	Blue crab potters active in Virginia's ocean waters in 2002
North Carolina	4	Conch potters without Federal permits active in North Carolina's ocean waters in 2002
	2	Fish potters without Federal permits active in North Carolina's ocean waters in 2002
South Carolina	--	Very little potting activity occurring in state open ocean waters
Georgia	159	Blue crab licenses issued in 2002[3]
Florida	--	Very little potting activity occurring in state open ocean waters

Note:

[1] According to the Connecticut Department of Environmental Protection, all conch potting activity takes place in waters exempt from ALWTRP requirements.

[2] According to the Delaware Department of Natural Resources and Environmental Control, all blue crabbing activity is limited to the waters of Delaware Bay, which are exempt from ALWTRP requirements.

[3] Crabbing activity within Georgia's state waters is limited to waters exempt from ALWTRP requirements.

Exhibit 6G-4

CALCULATIONS EMPLOYED TO ESTIMATE NUMBER OF STATE-PERMITTED VESSELS THAT WOULD BE AFFECTED BY ALWTRP REQUIREMENTS: OTHER TRAP/POT FISHERIES

State[1]	Permitted Vessels[2]	Percent Active[3]	Active Vessels	Percent Without Federal Permits[4]	State-Only Active Vessels	Percent OTP	OTP State Active Vessels	Percent of Waters Regulated[5]	Non-Exempt Vessels	Multiple Gear Scalar[6]	Vessels (Number of Gear Sets to be Modified)
Maine	416	--	16[7]	100%	16	--	16	50.2%	8	--	8
New Hampshire	7	25%	2	100%	2	--	2	81.7 %	1	--	1
Massachusetts	395	--	201[7]	100%	201	--	201	84.1 %	169	--	169
Rhode Island	998	25%	250	100%	250	2%[8]	5	70.5 %	4	134%	5
Connecticut	227[9]	--	34[7]	100%	34	--	34	0 %	0	--	0
New York	1197	25%	299	100%	299	2%[8]	6	31.4 %	2	134%	3
New Jersey	254	25%	64	100%	64	60%[10]	38	42.0 %	16	134%	21
Delaware	--	--	59	100%	59	--	59	19.7 %	12	134%	16
Maryland	362	--	13[7]	0%[11]	0	--	0	--	0	--	0
Virginia	--	--	3[7]	100%	3	--	3	16.1 %	0	--	0
North Carolina	--	--	--	--	6[7]	--	6	--[12]	6	134%	8

Key: Shaded columns represent interim estimates of the number of active and affected vessels. All values are rounded to the nearest whole number.

Notes:

1 Other trap/pot activity in South Carolina, Georgia, and Florida is limited to waters exempt from ALWTRP requirements.

2 Information provided by state. For detailed description, see Exhibit 6G-3. In cases where state provided specific numbers on multiple trap/pot permits, the total number is presented.

3 Where number of active vessels is unavailable, 25 percent of permitted vessels are assumed to be active, based upon data provided by other states.

4 Where number of vessels holding only state permits is unavailable, the analysis assumes that none of the vessels are federally permitted.

5 Percentage of state waters subject to ALWTRP requirements under Alternatives 2 through 6.

6 If more than one species is targeted within the state, the analysis scales the number of vessels by 1.34. This scalar represents the average number of different gear sets (i.e., black sea pass pots, scup pots) fished by vessels in states that report species targeted by each vessel.

7 Information provided by state. For detailed description, see Exhibit 6G-3.

8 This scalar is applied to state permit numbers that represent vessels fishing with all gear types and is based on the percent of total state landings (calculated from NMFS dealer database) caught with traps or pots.

9 According to the Connecticut Department of Environmental Protection, most conch potting activity occurs in waters exempt from ALWTRP regulations; thus, conch vessels are excluded from the estimate of affected vessels.

10 All fishermen using trap and pot gear in New Jersey are required to hold these permits. This scalar is applied to remove fishermen targeting only lobster and is based upon information on the number of New Jersey lobstermen provided by the state.

11 According to the Maryland Department of Natural Resources, all state trap/pot vessels hold Federal permits.

12 State estimate of active vessels represents vessels operating outside of exempt waters. Thus, the exempt water scalar is not applied.

Gillnet Fishery

Similar to the data reported for the other trap/pot fishery, Exhibit 6G-5 summarizes data on gillnet fisheries provided by representatives of state fisheries management agencies. As indicated in the exhibit, some state officials provided estimates of the number of permitted vessels, while others estimated the number of vessels that are actively operating within state waters. Exhibit 6G-6 summarizes the calculations applied to estimate the number of active gillnet vessels that are subject to ALWTRP requirements. As in the analysis of the other trap/pot fishery, the analysis applies scalars for the percentage of vessels that actively fish, percentage of vessels without Federal permits, percentage of vessels using regulated (i.e., gillnet) gear, and percentage of vessels fishing outside exempt waters. In addition, the analysis of gillnetting vessels also accounts for the assumption that all Maine-permitted gillnet vessels operate within exempt waters.

Exhibit 6G-5

DATA PROVIDED BY STATE FISHERIES MANAGEMENT AGENCIES: GILLNET FISHERIES

State	Number Provided by State Contact	Description of Commercial Fishing Data
Maine[1]	334	Permits with gillnet endorsement issued in 2003
New Hampshire	54	Gillnet permits issued in 2003
	17	Active gillnet permits, 2003
	10	Active gillnet permit holders who did not hold a Federal permit in 2003
Massachusetts	141	Gillnet permits issued in 2001
	64	Active gillnet permits reported in 2001
Rhode Island	371	Multi-Purpose licenses with gillnet issued in 2001
Connecticut [2]	227	Gillnet licenses issued in 2002
	48	License holders who reported actively fishing license in 2002
New York	1197	Foodfish licenses issued in 2002 (gear not specified)
New Jersey	446	Anchored/Staked gillnet licenses sold in 2002[3, 4]
	370	Drift gillnet licenses sold in 2002
Delaware	108	Licensed gillnetters (year unspecified)
	7	Estimated number of active gillnetters fishing in Delaware ocean waters (year unspecified)
Maryland	12	Oceanside commercial fishermen reporting use of anchored gillnets in 2002
	16	Oceanside commercial fishermen reporting use of drift gillnets in 2002
	4	Oceanside commercial fishermen reporting use of staked gillnets in 2002[3]
	6	Oceanside commercial fishermen reporting use of unclassified gillnets in 2002[3]
Virginia	20	Fishermen reporting use of drift gillnets in Virginia ocean waters in 2002
	100	Fishermen reporting use of sink/anchored gillnets in Virginia ocean waters in 2002
North Carolina	11	Drift gillnetters without Federal permits active in North Carolina state waters in 2002
	11	Set float gillnetters without Federal permits active in North Carolina state waters in 2002
	301	Set sink gillnetters without Federal permits active in North Carolina state waters in 2002
	30	Runaround gillnetters without Federal permits active in North Carolina state waters in 2002[5]
South Carolina	--	Small ocean gillnet fishery for sturgeon exists, but will close by 2005
Georgia	--	Gillnetting prohibited in state waters
Florida	--	Gillnetting prohibited in state waters

Notes:

1 Gillnetting within Maine's waters primarily involves lobstermen catching bait in exempted waters.

2 Most activity occurred within the exempted waters of Long Island Sound.

3 Staked gillnets differ from anchored gillnets. A staked gillnet is generally used in shallow waters. Rather than using weighted anchors to hold the net in place, as in anchored gillnetting, stakes are driven into the substrate to anchor the net.

4 In New Jersey, anchored gillnets and staked gillnets are regulated under the same permit.

5 Unclassified and runaround gillnets are grouped with anchored gillnets for this analysis, thus assigning them the highest possible conversion costs.

Exhibit 6G-6

CALCULATIONS EMPLOYED TO ESTIMATE NUMBER OF STATE-PERMITTED VESSELS THAT WOULD BE AFFECTED BY ALWTRP REQUIREMENTS: GILLNET FISHERY

State[1]	Type of Gillnet	Permitted Vessels[2]	Percent Active[3]	Active Vessels	Percent Without Federal Permits[4]	State-Only Vessels	Percent Gillnet	State-Only Gillnet Vessels	Percent of Waters Regulated[5]	Non-Exempt Vessels	State-Specific Scalar	Affected Vessels
Maine	Anchor	334	25%	84	100%	84	--	84	50.2 %	42	0[6]	0
New Hampshire	Anchor	54	--	17[2]	--	10[2]	--	10	81.7 %	8	--	8
Massachusetts	Anchor	141	--	64[2]	100%	64	--	64	84.1 %	54	--	54
Rhode Island	Anchor	371	25%	93	100%	93	--	93	70.5 %	65	--	65
Connecticut	Anchor	227	--	48[2]	100%	48	--	48	0 %	0	--	0
New York	Anchor	1197	25%	299	100%	299	6%[7]	18	31.4 %	6	--	6
New Jersey	Anchor	446	25%	112	100%	112	--	112	42 %	47	--	47
New Jersey	Drift	370	25%	93	100%	93	--	93	42 %	39	--	39
Delaware	Anchor	108	--	7[2]	100%	7	--	7	--[9]	7	--	7
Maryland	Anchor	--	--	22[2,9]	0.00%	0	--	0	--	0	--	0
Maryland	Drift	--	--	16[2,9]	0.00%	0	--	0	--	0	--	0
Virginia	Anchor	--	--	100[2]	100%	100	--	100	--[8]	100	--	100
Virginia	Drift	--	--	20[2]	100%	20	--	20	--[8]	20	--	20
North Carolina	Anchor	--	--	342[2,9]	100%	342	--	342	--[8]	342	--	342
North Carolina	Drift	--	--	11[2,9]	100%	11	--	11	--[8]	11	--	11

Key: Shaded columns represent interim estimates of the number of active and affected vessels. All values are rounded to the nearest whole number.

Notes:

1 Within Georgia and Florida state waters, gillnetting is prohibited. Within South Carolina's state waters, a small ocean gillnet fishery currently targets sturgeon but will close by 2005.

2 Information provided by state. For detailed description, see Exhibit 6G-5.

3 Where number of active vessels is unavailable, 25 percent of permitted vessels are assumed to be active based upon percentage of vessels active in states that reported both permitted and active vessels.

4 Where number of vessels holding only state permits is unavailable, the analysis assumes that none of the vessels are federally permitted.

5 Percentage of state waters exempt from ALWTRP requirements under Alternatives 2 through 6.

6 Within Maine, all gillnetting is assumed to take place within waters exempt from ALWTRP requirements.

7 This scalar is applied to state permit numbers that represent vessels fishing with all gear types, and is based on percent of total state landings (calculated from NMFS dealer database) caught with gillnets.

8 State estimates of permitted and active vessels represent vessels operating outside of exempt waters. Thus, the exempt water scalar is not applied.

9 Maryland and North Carolina officials provided the number of participants in specific anchored gillnet fisheries (e.g., stake vs. float). Because a fisherman may participate in more than one fishery, some vessels are counted twice.

Appendix 6H

ASSUMPTIONS EMPLOYED IN THE ANALYSIS OF VESSELS AFFECTED BY ALWTRP REQUIREMENTS

Exhibit 6H-1

SUMMARY OF ASSUMPTIONS MADE IN IDENTIFYING VESSELS AFFECTED BY ALWTRP REQUIREMENTS

Assumption	Basis/Application	Affected Fishery
Identifying Active Federally-Permitted Vessels		
Vessel activity in future fishing seasons will be equivalent to 2002 fishing activity.	The location and timing of fishing activity varies from year to year. The analysis is based on 2002 vessel activity data from the Southeast Logbook (Logbook) and Northeast Vessel Trip Reporting (VTR) systems, and assumes that these data are representative of activity in the future.	All Fisheries
The estimated number of affected vessels includes only those that made more than three trips in 2002.	Not all vessels included in the VTR and Logbook systems are active full-time. Because the compliance cost estimates for model vessels are based upon the quantity of gear typically employed by full-time fishermen, the analysis excludes vessels that are only occasionally active.	All Fisheries
Black sea bass, scup, red crab, hagfish, conch/whelk and shrimp are the species primarily targeted in the other trap/pot fishery. Vessels that are assumed to target other species are grouped into an "other" category.	Fishermen employ different gear types to target specific species within the other trap/pot fishery. Thus, the cost of complying with ALWTRP requirements will vary depending upon the species targeted/gear employed.	Other Trap/Pot
Target species are assigned to each trip by assuming that the species that comprises the greatest percentage of the catch by weight was the target species. The analysis only includes a vessel as active in a fishery if greater than ten percent of its trips targeted that species.	The weight of non-targeted species occasionally exceeds the weight of targeted species caught during a trip. To avoid characterizing such activity as targeting the wrong species, the analysis applies this threshold.	Other Trap/Pot
Identifying Active Vessels that Hold Only State Permits		
The estimated number of affected lobster trap/pot vessels is based on the number of fishermen who purchased more than 100 trap tags in 2003.	Not all fishermen are active full-time. Because the compliance cost estimates for model vessels are based upon the quantity of gear typically employed by full-time fishermen, the analysis excludes vessels that are only occasionally active.	Lobster Trap/Pv ot
The future level of activity for state-permitted vessels is equivalent to activity in the most recent year for which each state reported information.	The amount of fishing activity varies from year to year. The analysis assumes that the level of activity reported for each state is representative of future activity for that state.	Gillnet, Other Trap/Pot
For states lacking data on the number of state-permitted vessels that actively fish, the analysis assumes that 25 percent of permitted vessels are active.	This estimate is based upon the percentage of other trap/pot and gillnet vessels that are active in states that reported both permitted and active vessels.	Gillnet, Other Trap/Pot

Exhibit 6H-1

SUMMARY OF ASSUMPTIONS MADE IN IDENTIFYING VESSELS AFFECTED BY ALWTRP REQUIREMENTS

Assumption	Basis/Application	Affected Fishery
The percentage of state-permitted vessels that fish within exempt waters is proportional to the percentage of each state's waters that are exempt from ALWTRP requirements.	The analysis assumes that vessel activity is equally distributed within state waters. Consequently, the percentage of state waters exempt from ALWTRP requirements serves as a scalar.	All Fisheries
For states that are unable to estimate the number of state-permitted vessels that also hold Federal permits, the analysis assumes that the state vessels do not possess Federal permits.	Vessels that hold both state and Federal permits are included in the Federal data and should be excluded from the analysis of state vessels to avoid double-counting. However, it is not always possible to identify such vessels. The assumption employed in such cases will yield a higher (i.e., more conservative) estimate of regulatory compliance costs.	Gillnet, Other Trap/Pot
For states that cannot identify the species that other trap/pot vessels target, the analysis assumes that these vessels target species in the same proportion as federally-permitted vessels fishing within the same region.	Information on target species for other trap/pot vessels that hold only state permits is not available. The proportion of federally-permitted vessels targeting each species provides an indicator of the species that state-permitted vessels are likely to target.	Other Trap/Pot
Assigning Active Vessels to Regulatory Areas		
The analysis assumes that all activity for a trip reported in the VTR or logbook databases took place within the area indicated.	For each trip, federally-permitted fishermen submit VTR or Logbook data indicating the location of fishing activity. A vessel may have operated in multiple areas but only reported one location or an average location for that trip.	All Fisheries
The distribution of vessel activity observed from VTR data is used to estimate the geographic distribution of activity when a location is clearly misreported or unavailable.	Trips reported in the VTR database occasionally list coordinates that are incorrect (e.g., trip locations appear on land) or are missing geographic information.	All Fisheries
When areas within state waters are subject to different ALWTRP requirements, the analysis allocates an equal proportion of state-permitted vessels to each area.	Detailed information on the location of fishing activity for vessels that hold only state permits is not available. To characterize the ALWTRP regulations to which these vessels are subject, the analysis first identifies all areas within state waters that are subject to different ALWTRP requirements. The analysis allocates an equal number of vessels to each of these areas.	Lobster Trap/Pot, Gillnet
Vessels included in the Northeast data should not be recounted if also included in Southeast data.	Vessels may be active in both the Northeast and Southeast and consequently included in both the VTR and Logbook databases. To avoid double-counting in such cases, the analysis only considers the costs associated with vessel activity in the Northeast.	Gillnet, Other Trap/Pot

Exhibit 6H-1

SUMMARY OF ASSUMPTIONS MADE IN IDENTIFYING VESSELS AFFECTED BY ALWTRP REQUIREMENTS

Assumption	Basis/Application	Affected Fishery
Vessels targeting Jonah crab are included in the lobster trap/pot fishery analysis.	Commercial fishermen that catch Jonah crab typically use lobster traps/pots and participate in the lobster fishery. To avoid double-counting these vessels, the analysis does not separately identify vessels that target Jonah crab.	Other Trap/Pot